

HELMINTHOLOGICAL ABSTRACTS

Vol. I, No. 4.

177—American Journal of Hygiene.

- a. WRIGHT, W. H. & SCHAFFER, J. M.—“Critical anthelmintic tests of chlorinated alkyl hydrocarbons and a correlation between the anthelmintic efficacy, chemical structure and physical properties.” XVI (2), 325-428, 2 figs., 14 tables, 55 refs. [September, 1932.]
- b. KREIS, H. A.—“Studies on the genus *Strongyloides* (Nematodes).” XVI (2), 450-491, 42 figs., 34 refs. [September, 1932.]
- c. FOSTER, A. O. & CORT, W. W.—“The effect of a deficient diet on the susceptibility of dogs and cats to non-specific strains of hookworms.” XVI (2), 582-601, 4 tables, 10 refs. [September, 1932.]
- d. BROWN, H. W.—“The treatment of ascariasis and trichuriasis with hexyl-resorcinol pills.” XVI (2), 602-608, 3 tables, 2 refs. [September, 1932.]
- e. CHANDLER, A. C.—“Experiments on resistance of rats to superinfection with the nematode, *Nippostrongylus muris*. ” XVI (3), 750-782, 8 tables, 13 refs. [November, 1932.]
- f. STOLL, N. R.—“Studies with the strongyloid nematode *Haemonchus contortus* II. Potential infestation curves under conditions of natural reinfection.” XVI (3), 783-797, 3 figs., 1 table, 7 refs. [November, 1932.]

(a) Critical anthelmintic tests for intestinal parasites of the dog have been carried out by Wright and Schaffer with 18 chlorinated alkyl hydrocarbons. The data obtained warrant the assumption that the anthelmintic efficiency of these compounds is intimately linked with the water solubility and is not entirely dependant on the halogen concentration or position in the molecule.

Five of these drugs seem to be promising for the treatment of hookworm disease and ascariasis and these have been tolerated well by the host. Others, while being efficient as anthelmintics proved very toxic to the host. None of them showed any appreciable efficiency against Cestodes.

Most of these drugs produced definite pathological lesions in the gastrointestinal tract, liver and kidneys. The water solubility of these compounds is an important factor in anthelmintic efficiency against hookworms and ascarids. In a general way it may be said that in any one homologous series, anthelmintic efficiency increases directly with the lengthening of the hydrocarbon chain but there is however a corresponding decrease in water solubility and hence a stage is reached when the solubility of a higher member of the series will be so slight as to result in little or no increased anthelmintic efficiency. In each series therefore there exists an optimum solubility range within which greatest anthelmintic efficiency exists. This range differs in each series of homologous compounds.

Changes in the position of the chlorine atom or of the methyl radical within the molecule result in changes in both the solubility and anthelmintic efficiency.

P.A.C.

(b) Kreis reviews some of the species of the genus *Strongyloides* giving a detailed description of the morphology, biology, pathology, ontogeny and systematics of the species *S. stercoralis*.

In connection with the morphology of *S. stercoralis*, he notes several distinct characteristics which have previously been overlooked, particularly the presence of spears in the oesophagus of the rhabditiform larvae of the indirect life cycle and of the free-living male. He describes in detail all the different forms that occur and makes some observations on the life-cycle and on the bionomics of the larvae. A very full bibliography is given.

P.A.C.

(c) Foster and Cort were able to increase the susceptibility of dogs and cats to non-specific strains of hookworm by feeding diets low in vitamin and mineral content.

Five mature dogs, on the deficient diet were fed larvae of a strain of hookworm which had been shown to be but slightly infective to dogs. At autopsy, from 7-82 worms were recovered, which represents a percentage survival of from 0.9-15.25. The control puppies, on normal diets, only became very lightly infected.

The converse experiment, using the dog strain of the hookworm on cats was carried out. Those on a poor diet gave percentage survivals significantly greater than those obtained from cats on a normal diet. The authors here comment on the fact that experiments on cats are usually less satisfactory than those on dogs, as deficient diets frequently produce rapidly fatal results in cats. Attempts to infest mature dogs with larvae of *Necator americanus* were unsuccessful. In their final discussion the authors suggest that such experimental results may help to clear up certain problems of incidental infestation i.e. where a parasite is found in a host not usually considered as normal, and they speculate on the possibility of parasites becoming adapted to new hosts as a result of repeated incidental infestations.

P.A.C.

(d) Brown finds that crystalline hexylresorcinol given in the form of sugar coated pills each containing 0.2 gm. of drug was very successful in removing ascarids and whipworms from 650 human patients.

The procedure was to feed the pills in the morning on an empty stomach. An abundance of water but no solid food was allowed for 5 hours after treatment. A saline purge was taken in a large glass of warm water the following morning. The dose was 0.1 gm. per year of age up to 10 years: all persons over 10 years receiving the maximum dose. In addition all children aged an odd number of years were given 0.1 gm. of the drug extra because of the difficulty of cutting the pills in half. The efficiency of the drug was calculated from the egg count reduction. An average reduction of 90 per cent. *Ascaris* and 32 per cent. *Trichuris* was obtained with a single dose, many patients showing 100 per cent. reduction. When necessary a second dose was given three weeks after the first treatment and this made 93 per cent. of the patients totally free of worm parasites. This second dose was most frequently necessary with young children who often harboured a heavy infestation of *Ascaris*.

Some local irritation of the mouth was experienced by children who chewed up the pills forming a superficial "burn," which however was never deep. As a result of the desquamation of the epithelium, the appearance was sometimes alarming but on account of the local anaesthetic action of the drug, no complaints were made. Brown feels that this is in no way a contra-indication to its use as an anthelmintic.

P.A.C.

(e) Chandler publishes results concerning the immunity of rats to *Nippostrongylus muris*.

Natural immunity increased directly with the age of the host, though there were wide individual differences. Unbalanced diets produced no significant differences provided the animals were not seriously injured by the deficiency. A greater acquisition of worms did, however, result in some rats, fed exclusively on coarse vegetables and fruit until they were very emaciated and unthrifty in appearance.

In the absence of re-infestation, the peak of the infestation occurs at about three weeks after which there is a rapid and regular loss of worms. Inoculation of dead larvae of *Nippostrongylus muris* produces effects similar to the inoculation of living larvae. In both cases, only a slight degree of immunity is established after repeated doses of larvae have been given. Though the worm burden increases after each dosage, yet the growth of the worms is retarded and there is a tendency towards the inhibition of development beyond the fourth larval stage. Furthermore, the egg output is decreased. This small amount of immunity is, however, specific and larvae of a closely related genus *Longistriata* produced no immunity response to larvae of *Nippostrongylus*.

P.A.C.

(f) Stoll gives an analysis of a "closed universe of infection," in which two lambs were exposed to *Haemonchus contortus* under conditions of natural re-infection.

During the course of the infection the meteorological conditions prevalent at the time were distinctly favourable for the development of the free stages of the nematode. He was compelled for various reasons to transfer his lambs three times to other plots, but in each case they were free from *Haemonchus* larvae. An initial dose of 45 larvae was originally given to one lamb but later the only source of infection was that already inside the host, where it was in turn cumulative. From previous work, he took 8,000 eggs per day per larva ingested as his criterion of infection after a 30-day interval following ingestion of the larvae.

From the evidence obtained from egg counts throughout nearly six months, he calculates that only 1 in 4,000, 8,000 or 16,000 eggs deposited on the several plots reached maturity in the stomachs of the lambs, and suggests that this is an exceedingly small return from the standpoint of the parasites themselves. Under laboratory conditions a yield of at least 10 per cent. is expected. In spite of all the forces harmful to the worm from the time eggs are expelled through the developmental stages to maturity, in the course of the first four months the two lambs are estimated to have deposited nearly 500 million eggs on the plots.

P.A.C.

178—American Journal of Tropical Medicine.

- a. RIVAS, D. de.—“Intestinal parasitism. Diagnosis and treatment.” XII (6), 477-492, 4 figs. [November, 1932.]
- b. GRACE, A. W., GRACE, F. B. & WARREN, S.—“The parallel incidence of *Filaria bancrofti* and the β -haemolytic streptococcus in certain tropical countries.” XII (6), 493-508, 3 figs., 10 refs. [November, 1932.]

(a) Two new and simple techniques have been devised by Rivas, one for the separation of helminth ova from faeces, the other for treatment of intestinal parasitism.

(i) 1 to 2 gm. of faeces is shaken up with 5 or 6 cc. of 5 per cent. solution of acetic acid, then filtered through a double layer of gauze and collected in a centrifuge tube. An equal quantity of ether is then added and shaken vigorously for a minute to form an emulsion. This is immediately centrifuged for 2 or 3 minutes at 1,500 revolutions per minute. The 3 supernatant layers are poured away and the sediment is collected by a pipette and examined microscopically.

(ii) Temperatures of 45° C. to 47° C. will kill any protozoan or metazoan in 5 to 10 minutes. A preliminary injection of 1 or 2 ounces of equal parts of 30 per cent. mag. sulph. and glycerine followed by 500 cc. of hot physiological salt solution at 45° C. to 47° C. is given by the duodenal tube; several applications are given at intervals of 2 or 3 minutes until a total of 1 or 2 litres has been administered. The patient will then desire to evacuate the bowels and the parasites will be found in the discharge. For parasites in the large intestine a 1 in 5,000 solution of copper sulphate at 52° C. to 55° C. is allowed to flow by rectal tube into the colon at the rate of 100 to 150 cc. per minute up to a total of 1 to 2 litres. Contra-indications are few, viz.: pregnancy, intestinal obstruction from adhesions, tumours, advanced debility and heavy infestation with *Ascaris lumbricoides*. R.T.L.

(b) In Jamaica *Culex fatigans* abounds but endemic *Filaria* infections are absent; Lymphangitis and Elephantiasis are very rare. Grace, Grace and Warren find a parallel low incidence of the β -haemolytic streptococcus and of *Filaria bancrofti* comparable to the parallel high incidence of these agents in British Guiana and in St. Kitts. In 100 consecutive abscesses in Jamaica staphylococcus occurred save in 6 per cent. which contained the β -haemolytic streptococcus. R.T.L.

179—Annales de Parasitologie Humaine et Comparée.

- a. DOLLFUS, R. P.—“Métacercare progénétique chez un planorbe.” X (5), 407-413, 4 figs., 5 refs. [September, 1932.]
- b. BRUMPT, E.—“Nemathelminthes parasites des rats sauvages (*Epimys norvegicus*) de Caracas. II. *Gongylonema neoplasticum*. Infections spontanées et expérimentales. (Note préliminaire.)” X (5), 414-424, 2 pls., 22 refs. [September, 1932.]
- c. TIMON-DAVID, J.—“Les kystes à Tetrameres du pigeon.” X (5), 425-430, 1 pl., 10 refs. [September, 1932.]
- d. EJSMONT, L.—“Note sur le genre *Isoparorchis*.” X (5), 453-457, 1 fig., 12 refs. [September, 1932.]
- e. DOLLFUS, R. P.—“Sur un *Lepoderma* de batraciens anoures, de l'île Maurice.” X (6), 509-513, 2 figs., 1 ref. [November, 1932.]
- f. MEHRA, H. R.—“Note sur le genre *Neopronocephalus* Mehra, 1932.” X (6), 544. [November, 1932.]

(a) Dollfus describes a progenetic metacercaria, one of the *Lepodermatoidea*, occurring in *Planorbis planorbis*.

Within the snail were found sporocysts, cercariae, encysted metacercariae, and excysted metacercariae. Even within the cyst the metacercariae are sexually mature and produce eggs containing a developing embryo. Spermatozoa were found, but such forms must necessarily be self-fertilizing. There is probably an alternative "normal" life cycle, involving a vertebrate host, but this remains undiscovered.

B.G.P.

(b) Brumpt found that, of 750 wild rats (*Epimys norvegicus*) examined post mortem in Venezuela, 300 were infected with *Gongylonema neoplasticum* in stomach or oesophagus.

In 18 cases papillomata were present in the stomach mucosa and in one case there was an associated carcinoma. The cancerous stomachs were from 3 to 7 times the normal weight. Experimental infection of 31 rats and 5 mice, extending in some cases over 300 days, failed to produce cancerous growths. Evidently predisposing factors exist in the particular host. *Hepaticola gastrica* was not present.

B.G.P.

(c) Timon-David has studied the encystment of *Tetrameres fissispina* within the glandular crypts of the proventriculus in the pigeon.

The female worm as it grows distends the cavity of the lobule to the destruction of the mucosa and most of the glandular tissue which is digested away, the resulting cyst being often larger than the original lobule. Adjacent lobules are compressed and distorted but are apparently preserved from cytolysis by the intervening connective-tissue tunic which surrounds each lobule. Contrary to previous opinion, the author finds that some of the diminutive males may occur *within* the cysts, and that the females are not always orientated with the oral extremity in the base of the lobule.

B.G.P.

(d) Ejsmont notes that the fish distomes *Isoparorchis trisimilitubis* Southwell, 1913 and *Leptolecithum eurytremum* Kobayashi, 1915 have been variously regarded as congeneric and even conspecific. Odhner (1927) regarded them as separate species of one genus in which *Distomum hypselobagri* Billet, 1898 should be placed as *species inquirenda*. After examining material Ejsmont concludes that only one species is involved and that therefore the name should be *Isoparorchis hypselobagri* (Billet, 1898) Odhner, 1927.

B.G.P.

(e) Dollfus here describes a new species, *Lepoderma momplei*, from the intestine of *Rana mascareniensis* and *Bufo regularis* in Mauritius. It differs from the only other species recorded from Anura, *L. himalayai* Jordan, in very slight details such as an oesophagus shorter than the pharynx, but the author points out that the other species of this genus are difficult to differentiate unless one knows the host and the locality.

B.G.P.

(f) Mehra points out that in his previous memoir on two species of *Neopronocephalus* he failed to designate the type-species. In order to conform with the amendment to Article 25 of the International Rules of Nomenclature, he here designates *N. triangularis* as type.

B.G.P.

180—Annali di Medicina Navale e Coloniale.

- a. VANNI.—“Sopra un Cestode parassita del Varano del Nilo.” Year 38, II (3'4), 571-574. [September-October, 1932.]
 b. PENSO.—“Sull'azione emolitica dell'*Ascaris lumbricoides* L.” Year 38, II (5,6), 695-706, 11 refs. [November-December, 1932.]

(a) A fourth species named *D. impervia* is added to the genus *Duthiersia*. It is characterized by the absence of the foramen in the bothridia.

R.T.L.

(b) Penso finds a haemolytic action in the body-fluid of *Ascaris lumbricoides* and in saline extracts of the cuticle and internal organs, the fluid and extracts having been centrifuged and filtered.

Haemolysis was demonstrated *in vitro* on washed red cells from man and rabbit, with controls, and *in vivo* by intravenous injection of filtered extract in a rabbit, after the accidental death of which in 12 days sections of the enlarged spleen revealed haemosiderin-like granules. The rabbit showed no toxic or anaphylactic symptoms during the injections. Dilution-tables illustrate the *in vitro* experiments.

B.G.P.

181—Annals and Magazine of Natural History.

- a. BAYLIS, H. A.—“A comparison of certain species of the nematode genus *Amidostomum*, with a description of a new species.” (Ser. 10), x (57), 281-287, 5 figs., 7 refs. [September, 1932.]
 b. BIPIN BIHARI SINHA.—“On the morphology and systematic position of *Cephalogonimus magnus*, sp. n. (Trematoda), from *Trionyx gangeticus*.” (Ser. 10), x (58), 419-428, 3 figs., 13 refs. [October, 1932.]
 c. BAYLIS, H. A.—“Three notes on parasitic nematodes.” (Ser. 10), x (59), 497-502, 3 figs., 5 refs. [November, 1932.]
 d. LE ROUX, P. L.—“On *Trichostrongylus pietersei*, sp. n., a parasite of sheep and goats.” (Ser. 10), x (59), 502-504, 2 figs., 2 refs. [November, 1932.]
 e. BAYLIS, H. A.—“What is the common ‘large roundworm’ of chickens?” (Ser. 10), x (59), 520-524, 10 refs. [November, 1932.]

(a) Baylis tabulates the differences shown by the species of *Amidostomum*, viz.: *A. skrjabini*, *A. fuligulae*, *A. anatinum*, *A. chevreuxi* and *A. monodon* and describes a new species *A. spatulatum* from the Bean goose, *Anser fabalis*.

He regards *A. fuligulae* as a synonym of *A. skrjabini* but does not accept as fully established Cram's contention that *A. skrjabini* is identical with *A. chevreuxi*. Sugimoto's description of *A. anatinum* is based on a single female and there are few reasons for separating it from *A. skrjabini*. The new *A. spatulatum* can be readily distinguished from all other described forms by the remarkable outline of the spicules.

R.T.L.

(b) In *Cephalogonimus magnus* the testes are situated one behind the other as in *C. lenoiri* and *C. amphiuma*, but this new species differs from all members of the genus in the fact that the vitellaria do not extend beyond the posterior margin of the acetabulum. It is also much larger.

R.T.L.

(c) (i) *Ascaris granulosa* from the Frigate-bird resembles *Contraecium spiculigerum* very closely but the number and arrangement of the

male papillae differ. Baylis notes that there is a third pair of small lateral postanal papillae not figured by Schneider. (ii) The male of the filaria worm *Setaria pillersi* is redescribed from a kob in Uganda. The left spicule measures 0.28-0.3 mm. There are 10 pairs of caudal papillae and a lozenge-shaped median ventral papilla in front of the cloaca. (iii) Baylis has found along with *Trichuris ovis* from a bull in Toro, Uganda, a goat and a sheep in Zululand and a calf in Natal, specimens of *T. globulosa* previously recorded from the camel. It is therefore probably widespread in East and South Africa. A detailed description is given. R.T.L.

(d) A new species of *Trichostrongylus*, *T. pietersei*, has been found by Le Roux in merino sheep and Angora goats in South Africa. It is most closely related to *T. probolurus* from which it differs in the more slender build of the distal extremity of the spicule. R.T.L.

(e) The "large roundworm" of chickens is, according to Baylis, *Ascaridia lineata* with which *A. perspicillum*, *A. hamia* and *A. granulosa* are synonymous. *A. lineata* is of world wide occurrence in the common fowl. The name *A. galli* Schrank has priority over *A. lineata* and should now replace it. R.T.L.

182—Annals of Tropical Medicine and Parasitology.

- a. GIBBINS, E. G.—"Natural malaria infection of house-frequenting *Anopheles* mosquitoes in Uganda. VII. Internal parasites other than malaria." xxvi (3), 239-266. [October, 1932.]
- b. GORDON, R. M., HICKS, E. P., DAVEY, T. H. & WATSON, M.—"A study of the house-haunting culicidae occurring in Freetown, Sierra Leone; and of the part played by them in the transmission of certain tropical diseases, together with observations on the relationship of anophelines to housing, and the effects of anti-larval measures in Freetown." xxvi (3), 273-345, 20 tables, 42 refs. [October, 1932.]
- c. HICKS, E. P.—"The transmission of *Wuchereria bancrofti* in Sierra Leone." xxvi (3), 407-422, 4 tables, 25 refs. [October, 1932.]
- d. NAGATY, H. F.—"The genus *Trichostrongylus* Looss, 1905." xxvi (4), 457-518, 77 figs., 4 tables, 66 refs. [December, 1932.]

(a) In this paper on malaria Gibbins notes that nematode embryos were seen on a few occasions in *Anopheles costalis*, *A. funestus*, *A. theileri* and *A. mauritanus*. R.T.L.

(b) Gordon, Hicks, Davey and Watson tabulate the results of dissection of *Anopheles* for Filaria in Freetown and Kissy. In Freetown 1 per cent. of *Anopheles costalis*, out of 1,156 specimens, showed larvae in the head or proboscis while in Kissy the incidence was 2.7 per cent. out of 1,157 specimens of *A. costalis* and 1.2 per cent. of 908 specimens of *A. funestus*.

The part played by Culicini in the transmission of *F. bancrofti* is negligible compared with that of the Anophelini in Freetown. The Filaria infection rate in *Anopheles* is three times as great in the wet as in the dry season, the *A. costalis* rate being twice and the *A. funestus* rate eight times as great. It is probably attributable to the remarkably high humidity. The incidence of Filaria infection in mosquitoes of various wing grades is tabulated. R.T.L.

(c) Hicks has supplemented the observations of Gordon *et al.* (see No. 182b above) on nematode infections of wild mosquitoes in Freetown by testing the susceptibility of laboratory-bred anophelines.

He finds, contrary to Bahr's experience with culicines, that when the number of microfilariae in the patient's blood was 10 to 15 per c.mm., a considerable number became infected without increase in the mortality. When less than 1 microfilaria per c.mm. occurred infection failed. *Anopheles costalis* and *A. funestus* allowed complete development and are to be regarded as efficient and important vectors. *A. rhodesiensis* allows complete development but has not been found infected naturally. *A. squamosus* is also efficient but is an uncommon species in Sierra Leone. Only in one case did a proboscis infection result with *Stegomyia fasciata*. Although incomplete development frequently occurred this species cannot be regarded as a vector of human filariasis.

R.T.L.

(d) The important genus *Trichostrongylus* has been monographed by Nagaty.

The 13 species have been redescribed and new illustrations have been made except in the cases of *T. probolurus* and *T. orientalis*. *T. fiberius* and *Strongylus pigmentatus* are too insufficiently known to be definitely allocated to the genus. The genus *Libyostrongylus* Lane is not a synonym of *Trichostrongylus* and stands. As *T. delicatus* Hall, 1916 is shown to be a synonym of *T. colubriformis* this is now recorded as a parasite of the squirrel *Sciurus aberti minus*. Three species from wallabies viz.: *T. asymmetricus* Cameron, 1926, *T. australis* Wood, 1931 and *T. dissimilis* Wood, 1931 are taken out of the genus *Trichostrongylus* and in a footnote the new generic name *Asymmetricostrongylus* is given without a description.

R.T.L.

183—Annual Bulletin of the Department of Animal Health, Northern Rhodesia, 1931.

a. LE ROUX, P. L.—“Notes on the more important worms of cattle, sheep and pigs in Northern Rhodesia.” pp. 9-24. [1932.]

(a) Le Roux lists all the more important trematodes, cestodes and nematodes of cattle, sheep and pigs in Northern Rhodesia. Each species or closely-related group is then considered from the aspects of life-history, prevention and treatment.

Fasciola gigantica is the common liver-fluke, though *F. hepatica* does occur, and probably acts as a vector for the causal organism of Quarter Evil. Paramphistomes are universally present in ruminants, the young adult stages being undoubtedly injurious; *Schistosoma mattheei* and *S. spindalis* are the common blood-flukes. Hydatid is not uncommon in cattle, sheep and pigs, and *Moniezia expansa* is most troublesome in young sheep and cattle. *Stilesia hepatica*, though common in the bile-ducts of sheep, appears not to be harmful. Most of the usual roundworms are present, ascarids, hookworms, nodular worms, wireworms and trichostrongyles. *Gaigeria pachyscelis* is the commoner hookworm of sheep, and pig hookworm (*Globocephalus* sp.) has been found for the first time in Africa south of the equator.

B.G.P.

184—Arbeiten aus der Biologischen Reichsanstalt für Land-und Forstwirtschaft.

- a. GOFFART, H.—“Untersuchungen am Hafer-nematoden *Heterodera schachtii* Schm. unter besonderer Berücksichtigung der Schleswig-Holsteinischen Verhältnisse I. III. Beitrag zu: Rassenstudien an *H. schachtii* Schm.” xx (1), 1-26, 8 figs., 18 refs. [July, 1932.]

(a) Goffart describes the conditions under which *Heterodera schachtii* causes damage to oats in Schleswig-Holstein, and discusses the significance of the morphology and physiology of this strain of the parasite in relation to the consistency of strains and their host-plant groups.

Oats showed damage in soil with a low cyst-content as compared with that of “beet-sick” soil. The damage occurred chiefly where cereals were grown four or five times in succession, and was greatest when the April and May rainfall was high and the May temperature below normal. Statistical variation measurements of eggs and cysts showed that constant differences existed between the beet and oat strains. Similar measurements of larvae showed a two-peaked curve, differentiating “major” and “minor” forms, the latter corresponding with the larvae of the beet strain of Schmidt. The proportions of “major” and “minor” larvae differed widely in different cysts, and some of the latter were viable and reacted to stimulation with *Brassica campestris*, although the “major” forms reacted only to oats. Physiological experiments showed that oats, rye and wheat were all susceptible and that the larvae penetrated the roots of 14 other species of Gramineae, and in some cases completed their development. Root penetration also took place in many cultivated forms of the Cruciferae and Chenopodiaceae, but was not followed by cyst formation. Red clover was found to become infected under experimental conditions and the larvae produced on this host corresponded to the “minor” forms, but were all viable. The cysts also differed in shape from those formed on oats, and the name *H. schachtii* var. *trifolii* is suggested for this strain. Normally the host-plant group of the oat strain is considered to be confined to the Gramineae, although red clover may be included under exceptional conditions. In general only one generation of the parasite develops in one year, larvae which penetrate winter cereals in the autumn hibernating until the spring. *Cylindrocarpon radiculicola* Wr. was found to be a frequent parasite of the cysts, but was considered useless as a control measure. Varietal immunity and resistance were found to exist in barley but not in oats. Crop rotation and the cultivation of immune plants previous to oats, the growing of winter in preference to summer cereals, shallow ploughing and repeated rolling after sowing to reduce the oxygen content of the soil, and the avoidance of rich nitrogenous manures, are advised as control measures. M.J.T.

185—Archiv für Experimentelle Pathologie und Pharmakologie.

- a. ERHARDT, A. & KEIL, W.—“Weinsäurewirkung bei chronischer Opisthorchiasis.” CLXVII (3/4), 334-337. [12th September, 1932.]

(a) Tartaric acid has been used by Erhardt and Keil as a therapeutic agent against chronic Opisthorchiasis in cats.

Out of the four isomers only d-tartaric acid is effective while certain oxidation products of the acid are also ineffective. The authors put forward the theory that there is partial conversion inside the host, of d-tartaric acid to dioxymaleic acid which has a potent therapeutic action. P.A.C.

186—Archiv für Schiffs- und Tropen-Hygiene.

- a. KNABE, K.—“Beitrag zur Dauer von Filarieninfektionen.” xxxvi (9), 496-500, 19 refs. [September, 1932.]
- b. VOGEL, H.—“Über den ersten Zwischenwirt und die Zerkarie von *Opisthorchis felineus* Riv.” xxxvi (10), 558-561. [October, 1932.]
- c. ERHARDT, A.—“Chemotherapeutische Untersuchungen an der Opisthorchiasis der Katzen II.” xxxvi (11), 610-616, 2 tables. [November, 1932.]

(a) Knabe gives a clinical report and discussion on a supposed case of *Filariasis bancrofti* from the aspect of the duration of filarial infections. Infection took place in 1915 in Samoa, and since 1920 the patient has lived in Germany. There is a history of intermittent swelling and abscess-formation in the right arm, the copious pus containing *Staphylococcus pyogenes albus* in abundance. No trace of filariae or microfilariae. Symptoms continue (1932).

A case of double infection with *Loa loa* and *Filaria perstans* from the Cameroons, with no opportunity of reinfection since 1915, is also reported. Filariae and microfilariae were removed from time to time until 1930, when eosinophilia dropped from 22 to 2 per cent. and since when no microfilariae have appeared in the blood. B.G.P.

(b) Vogel's work in East Prussia has now revealed the first, molluscan, intermediary of *Opisthorchis felineus* which, as Askanazy showed in 1904, encysts in certain freshwater fishes. It is the somewhat rare *Bithynia leachi*.

The more common *B. tentaculata* is not infected. The opisthorchis eggs when laid contain a miracidium. This hatches in the intestine of the mollusc. The rediae are about 0.5 mm. long. The cercariae attain maturity in the tissue leaving the rediae at a very early stage. They have two eyespots. From a consideration of their larval developments it would appear that the two families Opisthorchidae and Heterophyidae are nearly related.

R.T.L.

(c) Erhardt compares the action of Fuadin with that of tartar emetic as therapeutic agents against Opisthorchiasis in cats.

He finds that they are almost equally effective but that Fuadin is preferable in that it produces no local reaction. Tartar emetic produces an intense local stimulation when applied in a therapeutic dose as a subcutaneous injection. The action of both Fuadin and tartar emetic is equivalent to that of trivalent antimony increased by the presence of sodium tartrate. Pentavalent antimony compounds are ineffective. P.A.C.

187—Archiv für Wissenschaftliche und Praktische Tierheilkunde.

- a. OHMES, H.—“Über die Wirkung einiger Wurmmittel beim Geflügel.” LXIV (6), 469-483, 2 figs. [23rd March, 1932.]
- b. GLUSCHKE, A.—“Die synthetische Darstellung neuer Wurmmittel und deren pharmakologische Auswertung. Ein Beitrag zur Kenntnis der Beziehungen zwischen chemischer Konstitution und vermifuger Wirkung in der Santoningruppe. II. Mitteilung. Pharmakologischer Teil.” LXV (3), 201-243, 15 figs. [10th August, 1932.]
- c. WETZEL, R.—“Zur Kenntnis des weniggliedrigen Hühnerbandwurmes *Davainea proglottina*.” LXV (6), 595-625, 12 figs., 1 pl., 2 pp. refs. [10th December, 1932.]

(a) Ohmes reviews the existing anthelmintics which have been successfully employed against the intestinal parasites of poultry, and describes some experiments he has made in their use.

He quotes from the literature the indications and the doses for kamala, anisol, areca nut, turpentine, male fern, tetrachlorethylene, carbon tetrachloride, and tobacco dust. His own experiments show that poultry can withstand very large doses of these drugs, particularly if the liquid vermifuges are mixed with liquid paraffin, which does not affect the anthelmintic action. Capillarias are difficult to touch, probably because they are protected by intestinal mucus, and so is *Heterakis*, because most drugs fail to enter the caeca. Caecal faeces can be recognised from their dark brown or green colour; by adding lycopodium to the anthelmintic as an indicator one can tell microscopically whether the drug has entered the caeca. B.G.P.

(b) Gluschke has made a detailed chemical and pharmacological study of the anthelmintic action of santonin and its various substitution-products in relation to their chemical constitution.

This second pharmacological section follows a previously published section dealing with the chemistry of the santonin-group and the synthesis of related new compounds. Pharmacological experiments *in vitro* on leeches, earthworms and nematodes, toxicological experiments on various vertebrates including man, and anthelmintic experiments on dogs infested with ascarids, are described in turn, after which both sections of the work are extensively summarized. Two synthetic compounds, syntonin-a and syntonin-b, respectively acetic and propionic acid lactones of tetralol and both closely related to santonin, are considered to be useful non-poisonous anthelmintics with an action comparable with that of santonin. The pharmacological experiments are illustrated by 15 kymographic traces showing the response of muscle-preparations to the various compounds. B.G.P.

(c) Wetzel has redescribed in detail the adult *Davainea proglottina*, its distribution and incidence, the developmental stages, and the intermediate hosts.

The latter include not only the Limacidae determined by Grassi & Rovelli: *Agriolimax agrestis*, *Limax cinereus* and *L. flavus*, which are confirmed, but also the Arionidae: *Arion empiricorum*, *A. hortensis*, *A. circumscriptus*, and *A. intermedius*, and among the Helicidae *Cepaea nemoralis*. The illustrations include a coloured plate of these slugs and snails. B.G.P.

188—Australian Veterinary Journal.

- a. ROSE, A. L.—“The toxicity of carbon tetrachloride for sheep and cattle: a survey.” VIII (4), 122-137, 23 refs. [August, 1932.]
- b. GORDON, H. McL.—“A note on the longevity of *Moniezia* spp. in sheep.” VIII (4), 153-154, 2 refs. [August, 1932.]

(a) Rose here reviews the question of carbon tetrachloride poisoning of sheep and cattle in New South Wales, giving notes on the local treatment of some thousands of sheep.

The losses in sheep are not usually immediate but occur after the third day, and the lesions are gastro-enteric rather than hepatic. Under normal conditions the drug is well tolerated, but under certain little-understood predisposing conditions quite small doses may be fatal. The purity of the drug is not in question and in sheep, in contradistinction to cattle, calcium deficiency appears to be of little significance. The following factors also seem to be eliminated: sex and breed of sheep, lack of food before or after treatment, travelling after being drenched, and pre-existing liver damage. The evidence suggests that cold or wet weather at the time of drenching is an important predisposing factor, as also to a less extent may be unusual fatness in the sheep and a high protein diet. A curious feature of many non-fatal cases is the loss of wool. Cattle, especially milking cows, should not be given carbon tetrachloride unless absolutely necessary, and then calcium should be fed for at least a fortnight beforehand. B.G.P.

(b) Gordon records that eggs of *Moniezia* sp. appeared in the faeces of a sheep penned on clean concrete, where reinfestation was most unlikely, continuously for 15 days short of one year. This indicates a longevity considerably greater than the 30 days period of egg-laying found by Seddon (1931) in *M. expansa* in sheep. B.G.P.

189—Berliner Tierärztliche Wochenschrift.

- a. SALOMON, S.—“*Fascioloides magna* Lei deutschem Rotwild.” XLVIII (39), 627-628, 1 fig., 3 refs. [23rd September, 1932.]

(a) Salomon describes the macroscopic appearance of the liver of a red deer from Görlitz, and of the contained liver-flukes, *Fascioloides magna*. In several places in the liver tissue the bile ducts were enlarged to form extensive thick-walled cavities about 6 cm. long and 3 cm. in diameter, and in each cavity was found a fluke. The flukes measured 3.5-6.0 cm. long and 1.85-3.0 cm. wide. There appeared to be no tissue reaction beyond the confines of the distended bile-ducts. B.G.P.

190—Biological Bulletin.

- a. STUNKARD, H. W. & CABLE, R. M.—“The life history of *Parorchis avitus* (Linton) a trematode from the cloaca of the gull.” LXII (3), 328-338, 6 figs., 11 refs. [June, 1932.]

(a) With the cercariae of *Parorchis avitus* discharged from the oyster drill (*Urosalpinx cinereus*) Stunkard and Cable have experimentally infected nestlings of two species of terns, viz. *Sterna hirundo* and *S. dougalli*, as they proved more easily obtainable than the more common host *Larus argentatus*.

Attempts to infect mice, white rats and guineapigs failed. The various stages in the life cycle are described. The adult worms are viviparous; the miracidia occurring free in the terminal part of the uterus. Each miracidium contains a single fully formed redia. The cercariae encyst within 48 hours after leaving the snail and a second intermediate host is apparently unnecessary. *P. avitus* and *P. acanthus* are accepted as separate species and their differences discussed.

R.T.L.

191—Blumen- und Pflanzenbau.

- a. GOFFART, H.—“Ueber eine Aelchenkrankheit an Päonien.” VI (10), Reprint, 1 p. [1st October, 1932.]

(a) Goffart reports the occurrence of *Aphelenchus olesistus* in certain varieties of paeonies imported into Germany from Holland.

The leaves of infected plants showed discolouration, but the chief seat of infection was in the flowers which withered and failed to open. Other varieties of paeony were not affected although grown in the same soil. It is recommended that the root-stocks should be soaked for 15 minutes in a 1 per cent. solution of Uspulum, or for 30 minutes in a 1:40 solution of formalin before transplanting.

M.J.T.

192—Bollettino del Laboratorio di Zoologia Generale e Agraria del R. Istituto Superiore Agrario in Portici.

- a. TRAVASSOS, L.—“Una specie del genere ‘*Neoplectana*’ Steiner (*Nematoda-Oxvuridae*) parassita del *Conorrhynchus* (*Cleonus*) *mendicus* Gyll. (*Coleoptera-Curculionidae*).” XXVI, 115-118, 7 figs., 1 ref. [1932.]

(a) Travassos gives a morphological description of *Neoplectana menozzii* Travassos, 1931 which parasitizes *Conorrhynchus mendicus* Gyll., a serious weevil pest of sugar-beet in Italy.

The author takes the opportunity of emending certain mis-statements he made in the first published account of the nematode (*Boletim Biologico*, Fasc. 19, pp. 150-154, 1931). The habitat of the parasite is the abdominal cavity of the larvae, pupae and adults of the weevil and not the digestive tract as originally stated, while the source of the material was Bientina, Tuscany and not Genoa. Brief mention is made regarding the technique of fixation and preservation of helminthic material from invertebrate hosts.

J.N.O.

193—Brasil-Medico.

- a. FRÓES, H. P.—“Identificação de microfilarias vivas em liquido ascitico sero-fibrinoso, proveniente de um malariento parasitado pela ‘*Wuchereria bancrofti*’ e em quem se não verifica a periodicidade habitual das microfilarias no sangue peripherico.” XLVI (41), 860-861. [October, 1932.]

(a) Fróes describes a case of double infection with malaria and *Wuchereria bancrofti* in which the microfilariae, which failed to show nocturnal periodicity in the peripheral blood, also appeared in ascitic fluid obtained by puncture.

B.G.P.

194—British Medical Journal.

- a. FALLON, W. M.—“A case of hookworm disease.” No. 3740, 515. [10th September, 1932.]
 b. HARPER, P.—“Complications of hookworm disease.” No. 3740, 535. [10th September, 1932.]

(a) Hookworm infection in a missionary who had left Nigeria 28 months previously is reported by Fallon from Galway. Ova were present in large numbers in the stool. There was an eosinophilia of 75 per cent., but the red cells count gave 4,438,000 and the haemoglobin 85 per cent. The blood picture persisted after the removal of the parasites. R.T.L.

(b) Harper cites two rare conditions resulting apparently from hookworm infection, viz., (i) polyarthritis with high fever and a general resemblance to acute rheumatism, (ii) a tendency to haemorrhage from the smaller arteries and capillaries which may be of great importance in some surgical, gynaecological and obstetric cases. He mentions a case of obstinate menorrhagia in which complete relief followed the expulsion of hookworms. R.T.L.

195—Bulletin de l'Académie de Médecine.

- a. MAROTEL.—“Nouveau traitement de la distomose hépatique.” CVIII (34), 1247-1250. [15th November, 1932.]

(a) Anthelmintics administered three times, in April, July and October, will eradicate fluke in a single year from an infected flock, for the infective larvae do not survive more than 12 months and the young flukes take three months in which to become adult. The author recommends terebinthine-benzol and carbon tetrachloride in preference to oil of male fern. R.T.L.

196—Bulletin Agricultural Department, Cyprus. (Entomological Series.)

- a. MORRIS, H. M.—“Insect pests and fungus diseases of Cyprus and their control.” No. 3, 56 pp., 12 figs. [1932.]

(a) Morris summarizes control measures which have proved valuable for root knot disease.

Steam treatment of soil, heavy manuring of slightly infected trees, and the removal of badly diseased trees with subsequent sterilization of the soil with formaldehyde, and the avoidance of infected nursery stock are advised. Two or three years fallowing or cultivation of immune crops with elimination of all susceptible weeds, are recommended for cleaning infected land. M.J.T.

197—Bulletin. Massachusetts Agricultural Experiment Station.

- a. ANON.—“Eradication of nematodes in greenhouse soils by the use of chemicals.” No. 280, pp. 192-250. [1932.]

(a) The Massachusetts Agricultural Experiment Station reports favourably on carbon bisulphide emulsion treatment for the control of nematode diseases in greenhouse vegetables. Both commercially prepared and home-made emulsions, applied to infested soil, gave satisfactory results in repeated tests. While tomatoes with gall-free roots were grown in treated soil, the control plants were heavily attacked (p. 205).

Liquid orthodichlorobenzene was also used with good results. A mixture of cyanogas and orthodichlorobenzene applied to the soil eradicated nematodes. Orthodichlorobenzene was found to aid in the retention of hydrocyanic acid gas in the soil (p. 206).

In the same Report, dwarf or crimps in strawberry caused by *Aphelenchus fragariae* is recorded for the first time in Massachusetts (p. 207). M.J.T.

198—Bulletin, Ministry of Agriculture and Fisheries.

- a. HODSON, W. E. H.—“Narcissus pests.” No. 51, 39 pp., 4 figs., 5 pls., 30 refs. [June, 1932.]

(a) Hodson gives a general account of the prevalence, life-history, methods of spread and effect on the host of the bulb-eelworm, *Anguillulina dipsaci* and the root eelworm *A. pratensis*, with details of practical control methods, especially the hot water treatment.

The symptoms indicative of attack by *A. dipsaci* are described together with the development, life cycle, and biology of the nematodes, both free in soil and within the host. Thus factors which favour the rapid multiplication and spread of the parasite are explained and precautionary measures such as the disposal of infected foliage and bulbs, the destruction of susceptible weeds and the necessity for proper drainage, etc., are emphasized.

Methods of cleaning infested soil by rotation and the treatment of affected crops in the soil are dealt with. The hot water treatment, immersion for 3 hours at 110°F., is described and recommended both as a curative and precautionary measure, and the method and time for applying this to various stocks is discussed. Suitable after-treatment of bulbs such as drying, and the effects of the treatment on different stocks are described. The withholding of narcissus from land infected with *A. pratensis* for at least one year is recommended. M.J.T.

199—Bulletin de la Société Médico-Chirurgicale de l'Indochine.

- a. HOUEMER, E.—“A propos de Gordiacés, parasites d'insectes orthoptères du Tonkin.” x (2), 227-231, 1 text fig., 12 refs. [February-March, 1932.]
b. MASSIAS, C.—“Le traitement de l'helminthiase par l'essence de chéno-podium.” x (7), 700-704, 7 refs. [October, 1932.]

(a) Houdemer, writing on the Gordiacea in general, briefly describes their morphology and life history and mentions that they occur in Myriapods and in insects of the orders Orthoptera, Neuroptera and Coleoptera as well as in human beings on occasion.

Three types of larval evolution have been observed: (i) the normal type where the host insect ingests the larva which perforates the gut wall, completes its development in the body cavity and ultimately escapes as an adult. (ii) The abnormal type in which the host is not favourable for development, e.g., larvae of Diptera, Ephemeridae and so forth. Unless devoured by a suitable host the Gordius will perish in this abnormal host. (iii) The larva may encyst on the submerged portion of a plant and under certain circumstances be ingested later by a phytophagous

insect and so complete its development ; this particularly applies to *Gordius aquaticus*. Insects with different feeding habits, e.g., exclusively carnivorous, herbivorous and carnivorous combined or omnivorous, may serve equally well as hosts. Although cases of accidental human infestation, due usually to drinking water containing parasitized insects, are mentioned opinion tends to regard such infections as of short duration since the helminths, normally found in springs or cold fresh water, would not withstand the digestive action of human gastric fluids. J.N.O.

(b) Oil of chenopodium is an efficient remedy for ascaris and hookworm but should be given in capsules. It has also proved effective, with Massias, in two cases of *Strongyloides* infection. Care in administration is required. The author has not met with any accidents. R.T.L.

200—Bulletins de la Société de Pathologie Exotique.

- a. JOYEUX, C., & BAER, J. G.—“Recherches sur les cestodes appartenant au genre *Mesocestoides* Vaillant.” XXV (9), 993-1010, 3 figs., 24 refs. [9th November, 1932.]

(a) Joyeux and Baer describe the feeding of cestode larvae of the *Tetrathyridium* type, obtained from the snake *Elaphe scalaris* near Marseilles, to a laboratory-reared cat, and the subsequent discovery of *Mesocestoides* adults at autopsy 56 days later.

After reviewing the species of *Mesocestoides* they conclude that the present specimens, which are described and figured, are *M. ambiguus* Vaillant, 1863. *Tetrathyridium* larvae have long been considered as larval stages of *Mesocestoides* spp. and the present discovery substantiates this, since the rare natural infections in cats have been *M. lineatus* ; *M. ambiguus* was originally described from the reptile-eating *Viverra zibetha*. B.G.P.

201—Bulletin de la Société Zoologique de France.

- a. DOLLFUS, R. P.—“Amoenitates Helminthologicae. II. Qu'est-ce que le genre *Corynesoma* Leuckart ?” LVI (5), 410-419. [15th January, 1932.]
b. LOPEZ-NEYRA, C. R.—“Sur la classification du genre *Davainea* (s.l.).” LVI (6), 534-541, 3 figs. [February, 1932.]

(a) Dollfus finds that *Corynesoma pellucidum* Leuckart in Diesing, 1850, a common tetrarhynchid larva in *Trigla* and other teleosts, is synonymous with “*Tetrarhynchus benedeni*” or “*T. erinaceus*.” To avoid confusion in nomenclature he suggests that *Corynesoma*, which was originally made by Leuckart in manuscript, should be made a *nomen rejiciendum* and *Corynosoma* Lühe, 1904 (Acanthocephala) a *nomen conservandum*. B.G.P.

(b) In 1929 and 1931 Lopez-Neyra proposed a new classification of the old genus *Davainea*, a proposal which Baer criticized in the above Bulletin in 1931. Lopez-Neyra here seeks to refute Baer's criticisms and to re-establish his classification. B.G.P.

202—Canadian Journal of Research.

- a. BOUGHTON, R. V.—“The influence of helminth parasitism on the abundance of the snowshoe rabbit in Western Canada.” VII (5), 524-547, 12 figs., 1 pl., 3 tables, 18 refs. [November, 1932.]

(a) Boughton has found a definite correlation between the percentage of *Lepus americanus* infested by parasites and the meteorological conditions in the different soil areas of the province of Manitoba.

The three most dangerous species are *Nematodirus triangularis* n. sp., *Synthetocaulus leporis* n. sp. and *Eimeria* sp. In 420 rabbits collected from 32 localities 9 species were found, 3 were Cestodes, 5 Nematodes and 1 an Acanthocephala. *N. triangularis* differs from *N. filicollis* and other species in the markedly triangular bursa. *S. leporis* comes near to *S. pulmonalis*. The author is of opinion that rabbit epidemics in Canada are due to the total influence of a number of infestations and diseases intensified to epidemic proportions by overcrowding. The relative frequency and seasonal incidence of the various helminths are tabulated. There is an interesting chapter on the biology and pathogenicity of these leporine parasites. There is a seasonal incidence of 100 per cent. in young rabbits as contrasted with a rate of 26 per cent. in adults.

R.T.L.

203—Ceylon Journal of Science, Section D. Medical Science.

- a. HIRST, L. F.—“Hookworm disease and Ceylon sewage works.” II (5), 245-275, 2 folding plans, 2 pages of refs. [20th May, 1932.]

(a) Hirst urges that the sludge from tropical sewage systems should if possible be removed by mechanical means. Labourers in sludge fields or on night-soil trenches should wear gumboots.

Larvae of free-living nematodes and of nematode parasites of domesticated animals derived from cattle marts and slaughter houses may be swept into the sewers. About 90 per cent. of the incoming ova are eliminated by the septic tanks operating on the dry weather side of the works at Colombo. If septic tanks are installed the double storey pattern should be adopted as the single storey tanks are relatively inefficient. Septic tank sludge could be completely disinfested before drying commenced by using separate sludge digestion tanks for the later stages of digestion. In the tropics there is a demand for dried activated sludge as fertiliser. Pigs devour a considerable quantity of human faeces and a high proportion of the hookworm eggs ingested retain their viability so that the pig may be an important factor in disseminating hookworm infection.

R.T.L.

204—China Journal.

- a. FAUST, E. C.—“The rôle of aquatic molluscs in the spread of human trematode infections.” XVI (6), 350-353. [June, 1932.]

(a) The life cycles of the various flukes which affect man are used by Faust to illustrate the adaptation of the Trematodes to particular groups of molluscs.

With the possible exception of *Dicrocoelium dendriticum* the molluscs responsible for the spread of human infections are aquatic or amphibious. The factors governing the existence of the snails in a particular area involve not only a knowledge of the climate and meteorology of the country but also the peculiar habits and customs of the population. The absence of *Oncomelania*

in Northern China and Korea is discussed. In Japan the use of lime to control *Oncomelania* has proved satisfactory but the soil in China is too alkaline. The suggestion is made that ammonium sulphate might be used to sterilize the night soil of fluke eggs. R.T.L.

205—Circular, College of Agriculture and Agricultural Experiment Station, University of Illinois. Urbana, Ill.

- a. THORP (jr.), F. & GRAHAM, R.—“Common parasites of horses.” No. 397, 29 pp., 24 figs. [September, 1932.]

(a) Thorp and Graham describe the common parasites of horses in Illinois, and discuss methods of treatment.

The common helminths are *Habronema* spp., *Trichostrongylus axei*, *Strongylus* spp., *Oxyuris*, *Setaria* and *Anoplocephala* spp. The circular, which is written primarily for the horse owner, describes the Illinois College's parasite control scheme which has been in operation since 1st January 1931, and under which nearly 130,000 horses have been treated with very promising results. T.W.M.C.

206—Comptes Rendus des Séances de l'Académie des Sciences.

- a. JOYEUX, C., BAER, J. G. & TIMON-DAVID, J.—“Recherches sur le cycle évolutif des trématodes appartenant au genre *Brachyloemus* Dujardin (syn. *Harmostomum* Braun).” CXC (21), 972-973. [21st November, 1932.]

(a) Joyeux, Baer and Timon-David, who recently traced the life-history of *Brachyloemus nicolli* [see abstract No. 10b], now add *Turdus merula* as a host of this fluke, and give further details of the intra-molluscan stages. The great disproportion between the large numbers of cercariae in the liver and the few metacercariae in the renal gland was investigated experimentally and by serial sections. The mature cercariae leave the mollusc by the anus and then attempt to re-enter. Many fail to do so; others enter the anus; apparently only the few that happen to enter by the excretory pore and so reach the renal gland are able to survive. B.G.P.

207—Comptes Rendus des Séances de la Société de Biologie.

- a. MONSERRAT, J. L.—“Hypertrophie déformante de la membrane chitineuse d'un kyste hydatique.” CXI (29), 75-77, 1 fig. [3rd October, 1932.]
 b. ALEXEIEFF, G.—“Sur l'hématopoïèse dans les helminthiases. Sur la question de l'origine des éosinophiles.” CXI (32), 355-358. [28th October, 1932.]
 c. CRUZ, W. O.—“Pathogénie de l'anémie dans l'ankylostomose. Importance prépondérante d'une perturbation dans le métabolisme du fer dans l'organisme.” CXI (33), 483-485. [4th November, 1932.]
 d. BACIGALUPO, J.—“*Limnea viatrix* d'Orb. infectée par des cercaires de *Fasciola hepatica*, à Buenos Aires.” CXI (38), p. 828. [9th December, 1932.]

(a) Monserrat describes a hydatid, extirpated from the lung of a man, in which there was hypertrophy of the cuticular membrane forming small nodules. Histological examination revealed numerous layers of cuticle in these nodules like the skins of an onion. The abnormality was confined to the cuticle, which enclosed a normal germinal membrane. B.G.P.

(b) Alexeieff reveals a close parallelism between eosinophilia in bone marrow (as observed by puncture in 16 human cases, 12 of which carried helminths) and that in the peripheral blood. In children under treatment for leishmaniasis, eosinophile cells reappear first in the bone marrow then in the blood.

B.G.P.

(c) Oswaldo Cruz has examined the blood and (post mortem) the bone marrow of the femur in numerous cases of hookworm anaemia and concludes that the anaemia is chiefly due to a lack of iron in the diet, since some cases improve haematologically on an iron diet without removal of the worms, and others from which iron was withheld failed to improve in spite of the effective removal of the worms. In the bone marrow the predominant cell was the orthochromatic haemoglobiniferous erythroblast.

B.G.P.

(d) By experimentally infecting guineapigs with the cercariae discharged from naturally infected specimens collected in the river Bouchard at Buenos Aires, Bacigalupo has demonstrated that *Limnaea viatrix* is an intermediate host of *Fasciola hepatica* in Brazil.

R.T.L.

208—Flugblatt. Biologische Reichsanstalt für Land- und Forstwirtschaft.

a. GOFFART, H.—“Rübennematoden.” No. 11, 4 pp., 3 figs. [January, 1932.]

(a) Goffart gives a popular account of *Heterodera schachtii*, its effects on beet, oats and potatoes, its life cycle and dissemination and measures which may be taken for its control.

Symptoms shown by the host plants—wilting, stunting and withering of the aerial parts, accompanied by profuse root-formation—are described, together with the morphology and life cycle of the parasite. The specialisation of races for different host plants is dealt with. “Neutral” plants are defined as those which the larvae can enter but in which they fail to complete their life-cycle. “Hostile” plants are those which cause the larvae to hatch without themselves being susceptible to attack. Crop rotation and special cultivation methods such as shallow hoeing and rolling after sowing are recommended for nematode-infested areas. Other methods of treatment which are not yet perfected are also discussed.

M.J.T.

209—Fukuoka Acta Medica.

a. GOTO, T.—“Beiträge zur Kenntnis der Migrationsroute von *Schistosoma japonicum* in den Endwirten.” xxv (3), 369-396, 22 figs. (In Japanese: German summary, pp. 11-13.) [1932.]

(a) Goto has attempted by experiments on dogs and mice with a counted number of cercariae to ascertain the route of the cercariae of *S. japonicum* from the skin to the portal system. His results convince him that *S. japonicum* can reach the portal vein by way of the mediastinum or the pleural cavity and thence through the diaphragm and that they can pass through the arterial route also.

R.T.L.

210—Gardeners' Chronicle.

- a. ANON.—"Soil sickness." XCII (2386), 205. [17th September, 1932.]

(a) The writer considers the cause of soil sickness to be in all cases the same although the appearance of symptoms may be hastened or emphasized by secondary factors such as eelworm.

Progressive changes in soil conditions, which have an adverse effect upon the plant are stated to be the essential cause, and the deterioration in physical condition of soil constantly used for tomato culture, and a similar condition arising in rose-beds in a clay soil are quoted as instances. Measures designed to alter the physical texture of the soil are recommended. M.J.T.

211—Geneeskundig Tijdschrift voor Nederlandsch-Indië.

- a. BONNE, W. M.—"Filariasis." LXXII (18), 1192-1195. [30th August, 1932.]

(a) In 10 months Bonne has examined in the Dutch East Indies 680 men, 411 women and 269 children, morning and evening, for microfilariæ. From positive cases, determined by staining with methylene blue, a second smear was stained with haematoxylin to differentiate *Microfilaria bancrofti* from *Mf. malayi*. Of the 1,360 persons examined 2 men and 1 woman were infected with *Mf. bancrofti*, and 5 men and 2 women with *Mf. malayi*. The latter failed to develop in *Culex fatigans*. B.G.P.

212—Indian Journal of Medical Research.

- a. MAPLESTONE, P. A.—"The genera *Heterakis* and *Pseudaspidodera* in Indian hosts." XX (2), 403-420, 3 pls., 11 tables, 8 refs. [October, 1932.]
 b. IYENGAR, M. O. T.—"Filariasis in North Travancore." XX (2), 671-672, 1 ref. [October, 1932.]

(a) Maplestone records the occurrence of species of the genera *Heterakis* and *Pseudaspidodera* in birds which have died in the Calcutta Zoological Gardens and in 100 domestic fowls purchased in the local market. From the 17 different hosts that he examined, 11 species of *Heterakis* are represented. Two of these are described for the first time. They are *H. pavonis* and *H. indica*. He discusses some small points of specific difference and concludes that certain species have been made without sufficient justification. He is of the opinion that *H. longicaudata* is a synonym of *H. gallinae* and that *H. lanei* and *H. hastata* are both synonyms of *H. isolonche*. He considers the shape and, within wide limits, the size of the spicules to be the only male characters reliable for specific differentiation. He recovered three species of the genus *Pseudaspidodera* of which one, *P. spinosa* is new. A description of this is given. P.A.C.

(b) Iyengar finds that the type of filarial infection in Shertalai and Ambalapuzha, two adjacent coastal taluks in North Travancore, is different from the *F. bancrofti* infection observed in other parts of India. The microfilaria is sheathed and has a definite nocturnal periodicity but is much shorter

and differs in microscopical detail from *F. bancrofti* approaching *F. malayi*. Moreover the chief transmitter is *Mansonia (Mansonioides) annuliferus*, and *Culex fatigans* is naturally and experimentally resistant.

R.T.L.

213—Indian Journal of Veterinary Science and Animal Husbandry.

- a. DATTA, S. C. A.—“The etiology of bovine nasal granuloma.” II (2), 131-140, 4 pls., 23 refs. [June, 1932.]
- b. BHALERAO, G. D.—“On some nematode parasites of goats and sheep at Muktesar.” II (3), 242-254, 4 pls., 1 table, 8 refs. [September, 1932.]
- c. RAO, M. A. N.—“*Cercaria saundersi*, n. sp.” II (3), 255-258, 1 pl., 4 refs. [September, 1932.]
- d. RAO, M. A. N.—“*Cercaria kylasami*, sp. nov.” II (3), 259-261, 1 pl., 1 ref. [September, 1932.]

(a) Datta has discovered that a new species of Schistosome is responsible for nasal granuloma in cattle in India.

It causes considerable loss to cultivators. Horses and buffaloes are apparently never affected. The disease is to be distinguished from Rhinosporidiosis, a few cases of which have been recorded from cattle in India. The parasite is closely related to *S. spindalis* Montgomery. The clinical symptoms and pathological histology are described. The heavy accumulation of eosinophile cells and the peculiar “actino” bodies or “clubs” are reactions to the parasitic capsular shells. There is no involvement of the tongue and jaw. The lesions are chronic and the response to Tartar Emetic is almost specific.

R.T.L.

(b) Bhalerao finds that seven species of nematodes occur in the goats and sheep used at Muktesar for experimental work.

In addition to *Ostertagia occidentalis*, *O. circumcincta*, *Haemonchus contortus*, and *Oesophagostomum venulosum* three new species are recognised, viz.:—*Ostertagia orientalis* n. sp. in the caecum and rarely abomasum of goats; *Dictyocaulus unequalis* n. sp. from the large bronchi of a Tibetan sheep—the form is nearly related to *D. filaria* but the spicules are smaller and the ventral ray has unequal branches—and *Varestrongylus pneumonicus* n.g., n. sp. from large and small bronchi of sheep and goats. A table is given differentiating the eight genera of the *Metastrongylidae*. *Varestrongylus* has four lips, spicules with bifid ends and a valve covering vulva and anus. It possesses a telamon and the vulva is at the posterior end of the body. The dorsal ray has five digitations.

R.T.L.

(c) In about 4 per cent. of *Limnaea accuminata* found in the Spur Tank, Egmore, there is a bifid tailed cercaria with fin folds on the rami, three pairs of mucin glands, 6 pairs of flame cells, two patches of cilia in each main excretory tube, and pigmented eye spots. This cercaria has been named *C. saundersi* by Rao.

R.T.L.

(d) From the same locality Rao has also described an amphistome cercaria from *Planorbis exustus* as *Cercaria kylasami* n. sp. The cercaria has pharyngeal pouches. The cercariae leave the redia while still immature and complete their development in the tissue of the molluscan host.

R.T.L.

214—Indian Medical Gazette.

- a. MOORTHY, V. N.—“An epidemiological and experimental study of Dracontiasis in Chitaldrug district.” LXVII (9), 498-504, 9 refs. [September, 1932.]
- b. MAPLESTONE, P. A. & MUKERJI, A. K.—“Hexylresorcinol as an anthelmintic.” LXVII (11), 610-612, 9 refs. [November, 1932.]
- c. MOORTHY, V. N.—“Treatment and prophylaxis of Dracontiasis.” LXVII (11), 617-619, 1 table, 5 refs. [November, 1932.]
- d. MAPLESTONE, P. A.—“The testing of anthelmintics.” LXVII (12), 673-674, 2 tables. [December, 1932.]

(a) Moorthy quotes a report by Karve that in the Chitaldrug district of Mysore the economic loss due to Guinea worm is nearly Rs. 40,000 a year. No infection of domesticated animals was observed. Blood changes during infection in man are noted. Epidemiological factors are the species of cyclops and their varying resistance to gastric acidity, the varying alkalinity of well water and the biological control effected by certain fishes of the genus *Barbus* especially *B. puckelli* which feeds voraciously on cyclops. R.T.L.

(b) Maplestone and Mukerji used Hexylresorcinol in the manner recommended by Lamson and obtained in 21 cases of Ascariasis a cure in 66.6 per cent. The egg reduction was 94 per cent. by the Stoll counting technique. In 26 cases of hookworm there were 7.7 per cent. of cures and a 71.4 per cent. egg reduction rate. Of 10 cases of *Taenia saginata* 4 were definitely not cured. The evacuated strobila is active when passed. The expense and the reduction of efficiency when given with food militate against its use. Moreover its reputed safety is scarcely yet substantiated and from experiments on dogs may prove illusory. The authors do not regard it as an efficient substitute for the older anthelmintics. R.T.L.

(c) According to Moorthy, acriflavine, 1 in 1,000, gives almost immediate relief after injection in Dracontiasis and assists in the removal of guinea-worm. Of the different chemical disinfectants so far tried for the sterilization of infected wells Perchloron (3 lbs. per 100,000 gallons) and copper sulphate (1 lb. per 200,000 gallons) used in combination proved most effective, rendering the wells free from cyclops for about a month. The use of the fish *Barbus puckelli* is also likely to prove useful. The juice and aqueous extract of young bamboo shoots contain cyclopedocidal substances. R.T.L.

(d) Maplestone has made a useful comparison of the value of Lane's and Stoll's techniques for the detection of eggs in the faeces after treatment. It is obvious that unless the method of egg detection is a highly efficient one the statement that eggs were absent after anthelmintic treatment may be misleading, and many cases of apparent cures will remain carriers. A tabular statement reveals the fact that Stoll's method is much less reliable than that of Lane for this purpose. R.T.L.

215—Indian Medical Research Memoirs.

- a. SHORTT, H. E., CAMPBELL, H. G. M. & LAL, C.—“Transmission experiments in Kala-Azar with hookworms.” No. 25.—Reports of the Kala-Azar Commission, India, Report No. II (1926-1930), pp. 73-79, 3 tables, 5 refs. [August, 1932.]

(a) None out of 27 Chinese hamsters given infective hookworm larvae, which had fed on Leishman-Donovan bodies acquired infection. R.T.L.

216—Japanese Journal of Dermatology and Urology.

- a. KITAMURA, K.—“Sensibilitätsänderungen der Haut gegen Hakenwurm-larven durch intrakutane Impfungen der Stoffwechselprodukte dieser Larven.” xxxii (2), 104-111, 2 pls. (In Japanese: German summary, p. 11.) [February, 1932.]
- b. KITAMURA, K. & NAKAMURA, M.—“Weitere experimentelle Studien über Dermatitis durch Hakenwurm-larven.” xxxii (4), 307-317, 1 chart, 22 refs. (In Japanese: German summary, p. 39.) [April, 1932.]

(a) Kitamura finds that the sensitivity of the skin of a rabbit to penetration by *Ancylostoma caninum* larvae is greatly reduced by the prior repeated inoculation of Ringer's solution containing the metabolic products of these larvae, a result not obtained with normal Ringer's solution. B.G.P.

(b) Kitamura and Nakamura have produced inflammatory changes in the skin of rabbits, accompanied by local eosinophilia, both by the application of hookworm (*A. caninum*) larvae and by the injection of egg-albumen or croton oil. Repeated injection gives a less marked increase in reaction in the latter case than with repeated applications of larvae. B.G.P.

217—Journal of Agricultural Research.

- a. STEINER, G.—“Some nemic parasites and associates of the mountain pine beetle (*Dendroctonus monticolae*).” XLV (7), 437-444, 5 figs., 7 refs. [1st October, 1932.]

(a) Steiner gives morphological descriptions of three new nematodes, viz., *Diplogaster occidentalis*, *Aphelenchoides conurus*, and *A. acroposthion*, taken in association with the Mountain Pine Beetle, *Dendroctonus monticolae* Hopk., at Metaline Falls, Washington, U.S.A., and discusses their economic significance and ecology.

In the case of the *Diplogaster* the worms were found inhabiting the mines and frass of the beetles and the author considers them to be associates rather than parasites of the insects. Of the two species of the genus *Aphelenchoides*, the taxonomy of which is discussed, one, *A. conurus*, is considered to live as a parasite and associate of the pine beetle. The other, *A. acroposthion*, is in a somewhat doubtful position since no exact facts were known as to its relationship to the beetle. Only adult male and female forms, having the appearance of true parasites, were found in the beetles' mines although the author is led to suppose that the larvae may be endoparasites. The various phases of the mutual relationship, e.g., free association, carrier, ectoparasitic and endoparasitic relationships, of the bark beetle and nematodes are also discussed.

J.N.O.

218—Journal of the American Medical Association.

- a. STILES, C. W.—“Hookworm disease of white school children: comparison of two methods of survey.” xcvi (25), 2189-2190. [18th June, 1932.]
- b. KELLER, A. E., HILLSTROM, H. T. & GASS, R. S.—“Lungs of children with ascari.” xcix (15), 1249-1251. [8th October, 1932.]
- c. WATERS, H. S. & O'CONNOR, F. W.—“*Diphyllobothrium latum*.” xcix (23), 1941-1942. [3rd December, 1932.]

(a) According to Stiles, clinical inspection of children in schools revealed symptomatic indications of hookworm infection in 77 per cent. and 79 per cent. of the children, whereas the microscopical method gave 97 per cent. and 90 per cent. For all practical purposes in judging whether hookworm is of educational and administrative importance the clinical procedure seemed sufficiently sound and reliable. R.T.L.

(b) X-ray examinations of the chests of eighty children with *Ascaris* were made and a widening in the hilar areas with increase in the broncho-vascular markings were regarded by Keller, Hillstrom and Gass as possibly due to the repeated migration of the larvae through the lungs. They are similar to those seen in the childhood type of hilar tuberculosis and the changes which follow repeated nonspecific lung infections. R.T.L.

(c) H. S. Waters and F. W. O'Connor report 3 cases of *Diphyllobothrium latum* in natives of New York City, and from enquiries amongst the fishmongers supplying the families they have ascertained that the source of infection was fish, mainly pike, from Canada and the Great Lakes region of U.S.A. R.T.L.

219—Journal of the American Veterinary Medical Association.

- a. SCHWARTZ, B. & PRICE, E. W.—“Infection of pigs and other animals with kidney worms, *Stephanurus dentatus*, following ingestion of larvae.” LXXXI (3), 325-347, 7 refs. [September, 1932.]
- b. CHASE, E. E.—“An outbreak of trichinosis in Portland, Oregon.” LXXXI (5), 666-668. [November, 1932.]
- c. BENBROOK, E. A.—“*Dracunculus medinensis* (Linnaeus, 1758) appears in the United States as a parasite of the fox.” LXXXI (6), 821-824, 2 figs., 2 refs. [December, 1932.]

(a) The migrations of *Stephanurus dentatus* have been studied experimentally in the pig, the guineapig, and the calf by Schwartz and Price.

The pathology of experimental infestations was essentially the same regardless of the portal of entry of the larvae, but the lesions differed from those caused by other nematodes which invade the tissues in that they were of an acute inflammatory nature suggesting the effects of pathogenic organisms rather than of worms. An exudative peritonitis was usually associated with migration of the larvae from the liver and was often accompanied by an acute exudative serofibrinous pleurisy. Thrombus formation occurred in the portal vein, gastro-hepatic artery and posterior vena cava due apparently to injuries by the worms. The worms, distributed by the circulation, first become localized in the portal vein and its branches, the periportal tissue, the hepatic tissue and the lungs. Only relatively late does invasion of the perirenal fat, ureters and kidneys and the psoas muscle happen. Worms were found piercing the liver capsule as early as 77 days after mouth infection but none occurred in the perirenal fat earlier than 137 days.

A calf experimentally infected remained free from renal lesions but showed the hepatic involvement usually seen in natural infections. In some respects *Stephanurus* and *Strongylus* resemble each other for both show evidence of arrestment and encapsulation of larvae during their migration. R.T.L.

(b) Chase reports that, following the eating of salami or summer sausage prepared locally, 17 cases of Trichinosis occurred at Portland, Oregon. In several of the cases typhoid was at first suspected. R.T.L.

(c) From a silver black fox *Vulpes fulva* in Milford, Iowa, U.S.A., several female specimens of *Dracunculus medinensis*, 25 cm. to 34 cm. in length, were removed by Benbrook from nodules beneath the skin of the legs in the carpal and tarsal regions. Each nodule contained pus and 2 to 4 worms. No other foxes were affected on the farm where the infected animal had been reared. The diagnosis was confirmed by the Zoological Division of the Bureau of Animal Industry. R.T.L.

220—Journal of the Egyptian Medical Association.

- a. KHALIL, M., HALAWANI, A. & HILMY, I. S.—“On the transmission of *Filaria bancrofti* in Egypt.” xv (6), 317-322, 2 refs. [June, 1932.]
- b. AZIM, M. A.—“Investigations on the anthelmintic power of hexylresorcinol.” xv (9), 635-637, 2 tables, 2 refs. [September, 1932.]
- c. KHALIL, M.—“Amendment to the name of a parasite of man.” xv (10), 720, 1 ref. [October, 1932.]

(a) In the village Kafr Ghatati, near Cairo, *Culex pipiens* are naturally infected with larvae of *F. bancrofti* to the extent of 5-7 per cent. in May and 20 per cent. in October. *Theobaldia longiareolata* were not infected. The susceptibility of *C. pipiens* was proved experimentally, the larvae reaching the proboscis in 16 days at 29°C. R.T.L.

(b) Azim found hexylresorcinol in chocolate coated pills each containing 0.2 grammes, efficient in cases of *Ascaris lumbricoides* and *Enterobius vermicularis*.

The results in cases of *Ancylostoma duodenale* were far from satisfactory. Dogs with *Heterophyes heterophyes* retained most of the flukes. The dose given to adults was 1.4 grammes and to children below twelve 0.8 to 1.2 grammes in 7 pills. A saline purge followed. R.T.L.

(c) Khalil states that an adult trematode reared from *Cercaria pleurolophocerca* was named by him *Kasr Aini* in a paper read in 1928 and that according to the Rules of Nomenclature it must be named *Kasr pleurolophocerca* (Sonsino 1892). [It may be noted that the spelling *Qasr Ainy* appeared twice in the 1928 paper published by Khalil in 1932.] R.T.L.

221—Journal of Helminthology.

- a. MORGAN, D. O.—“On three species of the genus *Capillaria* from the English domestic fowl.” x (4), 183-194, 17 figs. [September, 1932.]
- b. CLAPHAM, P. A.—“Hexylresorcinol as a general vermicide.” x (4), 195-208. [September, 1932.]
- c. SOLOMON, S. G.—“On a collection of parasitic worms from East Africa.” x (4), 209-230, 20 figs. [September, 1932.]
- d. CAMERON, T. W. M.—“On the pathogenicity of the stomach and lung worms of the cat.” x (4), 231-234, 8 figs. [September, 1932.]

(a) Morgan refigures and redescribes three species of *Capillaria* which are frequently met with in the domestic fowl in England and which cause

considerable damage, viz., *C. longicollis*, *C. columbae* and *C. retusa*. The author does not accept the general opinion that *T. longicollis* Dujardin, 1845, is a synonym of *C. retusa*. R.T.L.

(b) The anthelmintic action *in vitro* and *in vivo* of Hexylresorcinol has been tested by Miss Clapham.

Even in high dilution it is very toxic to free living nematodes and to the larvae of *Strongyloides* and *Ancylostoma*. The larvae of *Heterodera schachtii* showed a very noteworthy resistance. The miracidia of *Bilharzia* and *Fasciola* were quickly killed both before and after hatching. Penetration of the ova of *Dibothriocephalus latus* occurred rapidly and onchospheres were easily destroyed. The eggs and adults of *Hymenolepis murina* and of *Syphacia* and *Aspicularis* in mice were killed. This drug has therefore a wide range of potential usefulness but a warning note appears in the last paragraph which deals with the pathological changes which result. R.T.L.

(c) Gladstone Solomon records the results of his examination of a collection made in East Africa by Mr. Aneurin Lewis. It contained 19 species of Nematodes, 3 of Trematodes and 13 of Cestodes. Two new species are described, viz., *Trichuris spiricollis* from a gazelle and *Tatria fuhrmanni* from a "coot." R.T.L.

(d) Cameron describes and illustrates by beautiful microphotographs the pathology of two of the nematodes which cause lesions in the cat., viz., the stomach worm, *Ollulanus tricuspis* and the lungworm, *Aelurostrongylus abstrusus*.

The histological picture in the latter infection of the lung is contrasted with that caused by migrating *Ascaris* larvae. R.T.L.

222—Journal of the Indian Botanical Society.

- a. VENKATARAYAN, S. V.—“*Tylenchus* sp. forming leaf-galls on *Andropogon pertusus* Willd.” XI (3), 243-247, 2 pls. [1932.]

(a) Venkatarayan records the occurrence of galls of eelworm origin on the aerial portions of the grass *Andropogon pertusus* in several districts of India.

The galls, which occur on the leaves, leaf-sheaths and inflorescence axis are of a purple colour when mature and contain numerous adult and larval nematodes within a central cavity surrounded by sclerenchyma cells. The nematodes belong to the genus *Tylenchus* but a specific diagnosis has not yet been made. The author notes that no previous record exists of a gall-forming *Tylenchus* sp. attacking grass in India. M.J.T.

223—Journal of the Japanese Society of Veterinary Science.

- a. ONO, S.—“*Gymnopleurus* sp. as the intermediate host of *Spiruridae* found in the vicinity of Mukden, South Manchuria. II Report. Studies on the life history of *Arduenna strongylina*.” XI, 105-117, 5 figs. (In Japanese: English summary.) [1932.]

(a) The dung beetle *Gymnopleurus* sp. which Ono previously implicated (1929) as the vector of *Spirocerca sanguinolenta* is here shown experimentally to be the intermediate host of *Arduenna strongylina* in Manchurian pigs.

The experiments were made on rabbits in which these spirurids developed readily. The introduction of adult worms from naturally infected pigs to the stomachs of rabbits resulted in every case in the formation of a typical gastric ulcer. *Gongylonema* sp. also occurred in the experimental animals.

R.T.L.

224—Journal of the Kansas Entomological Society.

- a. WINBURN, T. F. & PAINTER, R. H.—“Insect enemies of the corn earworm (*Heliothis obsoleta* Fabr.)” v (1), 1-28, 47 refs. [January, 1932.]

(a) Winburn and Painter record that the larvae of the corn earworm *Heliothis obsoleta* were killed by *Diplogaster aerivora* when the latter occurred in the containers in which the insects were being bred. The larvae succumbed about the eighth day following the attack of the nematode. M.J.T.

225—Journal of Oriental Medicine.

- a. YOSASATO, M. & SUMI, I.—“Helminth eggs on vegetables in Mukden.” xvi (4). (In Japanese: English summary p. 51.) [April, 1932.]
- b. KATO, K.—“Ueber zwei Fälle von Cysticercus cellulosus hominis.” xvii (3), 28. [September, 1932.]

(a) Vegetables bought in the public market and in the streets of Mukden were examined daily by Yosesato and Sumi, and on 11 to 18 successive occasions *Ascaris lumbricoides* and *Trichuris trichiura* eggs were found on 17 per cent. of cabbage, 33 per cent. of onions, 43 per cent. of garden radish, 54 per cent. of spinach and 92 per cent. of lettuce. R.T.L.

(b) Kato has treated two human cases of Cysticercosis cellulosa with emetin; in spite of the patients' at first claiming to feel better, the drug appears to be without effect. The disease is not altogether rare in Manchuria.

B.G.P.

226—Journal of Parasitology.

- a. DAUBNEY, R.—“The life-cycle of *Momazia expansa*.” xix (1), 5-11, 13 refs. [September, 1932.]
- b. SCHWARTZ, B. & ALICATA, J. E.—“*Ascaris* larvae as a cause of liver and lung lesions in swine.” xix (1), 17-24, 3 figs., 4 refs. [September, 1932.]
- c. CHANDLER, A. C.—“A new species of *Longistriata* (Nematoda) from the cotton rat, *Sigmodon hispidus*, with notes on the division of the Heligmosominae into genera.” xix (1), 25-31, 2 figs., 17 refs. [September, 1932.]
- d. MCINTOSH, A.—“Some new species of trematode worms of the genus *Leucochloridium* Carus, parasitic in birds from Northern Michigan, with a key and notes on other species of the genus.” xix (1), 32-53, 9 figs., 1 table, 5 refs. [September, 1932.]
- e. STOLL, N. R.—“Note on re-infection under ‘natural’ conditions with a gut nematode of the rabbit.” xix (1), 54-60, 1 fig., 3 refs. [September, 1932.]
- f. SARLES, M. P.—“Development of an acquired resistance in rabbits by repeated infection with an intestinal nematode, *Trichostrongylus calcaratus* Ransom, 1911.” xix (1), 61-82, 8 figs., 3 tables, 18 refs. [September, 1932.]
- g. FOSTER, A. O.—“Prenatal infection with the dog hookworm *Ancylostoma caninum*.” xix (2), 112-118, 2 tables, 8 refs. [December, 1932.]
- h. BEACH, T. D. & ACKERT, J. E.—“Does yeast affect the growth and infectivity of the nematode, *Ascaridia lineata* (Schneider), in chickens?” xix (2), 121-129, 2 figs., 1 table, 10 refs. [December, 1932.]

- i. WINFIELD, G. F.—“On the immunity of snails infested with the sporocysts of the Strigeid, *Cotylurus flabelliformis*, to the penetration of its cercaria.” XIX (2), 130-133, 1 table, 5 refs. [December, 1932.]
- j. LUCKER, J. T.—“Some cross transmission experiments with *Gongylonema* of ruminant origin.” XIX (2), 134-141, 1 table, 11 refs. [December, 1932.]
- k. CORT, W. W.—“Variations in hookworm disease.” XIX (2), 142-147, 11 refs. [December, 1932.]

(a) To clarify the position of research on *Moniezia expansa* Daubney gives an account of a series of negative experiments carried out by him several years ago which hitherto have not yet been published.

An extensive list is given of invertebrates which have been searched as possible intermediate hosts. The question of antenatal infection is discussed and thought to be highly improbable. A series of muzzling experiments showed that muzzled lambs remained free from infection for several months while all the unmuzzled controls acquired infection. A solution will probably be found on orthodox lines. R.T.L.

(b) From time to time small pearly cysts, of one to two millimetres in diameter, have been noted in the lungs and liver of pigs.

The cysts contain granular material. Some contain a degenerated larva of the size and appearance of that of *Ascaris suum*. The macroscopical and microscopical appearances of the lesions are described in detail by Schwartz and Alicata. The possibility that the lesions might have been due to *Stephanurus dentatus* is dismissed on epidemiological grounds. R.T.L.

(c) Chandler gives a useful key for the ten known genera of *Heligmosominae*.

He considers that *Heligmosomoides* is synonymous with *Heligmosomum*; *Heligmonella* with *Longistriata*; *Viannella* with *Viannaia*; *Sincosta* with *Nematospiroides*; *Füllebornema* with *Heligmostrongylus* which in turn he regards as a subgenus of *Longistriata*. A new species *Longistriata adunca* is described from the cotton rat *Sigmodon hispidus* from Houston, Texas. R.T.L.

(d) From an examination of 189 birds of 63 different species, collected in Michigan, McIntosh found seven species of *Leucochloridium* of which six are new, viz., *L. cyanocittae* from the blue jay, *L. varia* from the black and white warbler, *L. actitis* from the spotted sandpiper, *L. melospizae* from the song sparrow, *L. seiuri* from the oven bird and *L. dryobatae* from the hairy woodpecker. Of unusual interest is the infection in members of the family Picidae, for sparrows, having seed-eating habits, are comparatively free from flukes. A dichotomous key based on the distribution of the vitellaria and the arrangement of the genital glands differentiates the 19 known species of *Leucochloridium*. R.T.L.

(e) Stoll deals with re-infection of the rabbit with *Trichostrongylus calcaratus* under natural conditions and finds that after an initial development of parasitism, an apparent host response follows with discharge of the worms. Infection can occur either by the mouth or by the skin. One infected animal was placed with several clean animals under conditions which allowed them

to pick up an infection. The response of the individuals varied considerably. Most generally developed a moderately high infection which later became lighter but another animal developed a high degree of resistance suddenly as was evidenced by a precipitate drop in egg count. P.A.C.

(f) Sarles fed weekly increasing doses of *Trichostrongylus calcaratus* to rabbits by mouth and skin and followed the infections by egg counts.

All the rabbits were susceptible at first as was shown by regular increases in egg counts but after 6-8 weeks a high degree of resistance suddenly developed. They proved refractory to superimposed re-infection and finally discharged the worms they harboured. This resistance was carried over to a second series of infections. This sudden loss of infection contrasts strongly with the gradual regular loss over 49 weeks which was experienced in animals given a single large dose of larvae. P.A.C.

(g) Foster found that all the puppies born to two mothers which had been experimentally infested with *Ancylostoma caninum*, developed a prenatal infection.

The mothers had received several thousands of larvae during pregnancy of which 10 and 20 per cent. were later recovered from the puppies as adult worms. At birth, however, the worms had not progressed beyond the larval stage. The puppies were uniformly infested and all succumbed within a few days to the injuries caused by the worms. One puppy which was still-born contained larvae within the tissues. The mothers had acquired some degree of resistance to the larvae as was shown by the heavy decrease in egg content of the faeces before the birth of the puppies but this resistance was not transmitted in any degree to the foetuses. All the puppies when born had a light infestation with *Ascaris*.

Puppies born to other mothers, heavily infested before impregnation, failed to acquire a prenatal infestation and were reared free from all parasites until needed for other experiments. P.A.C.

(h) Beach and Ackert show experimentally that yeast does not contain any special growth factor for *Ascaridia lineata* in the presence of an adequate diet and that it has no effect on the infectivity of the nematode.

They used three forms of yeast—Baker's yeast, Brewer's yeast and dry Baker's yeast. In each experiment it was found that, Brewer's yeast being somewhat unpalatable, the chicks receiving this form did not grow as rapidly as the others but the numbers and lengths of the worms recovered at autopsy were not significantly different. P.A.C.

(i) Winfield finds that snails infected with sporocysts of *Cotylurus flabelliformis* are highly resistant to the penetration of its cercariae.

There are two varieties of *Lymnaea stagnalis* that can serve both as first and second intermediate hosts. When snails from which cercariae were escaping were exposed to hundreds of free cercariae from another infested snail, it was seldom found that any larva had succeeded in penetrating the tissues of the host. Autopsies were then made from two groups of snails; the first group contained snails from which cercariae had been escaping for at least

11 days. During that time they had been exposed to the attack of several thousands of free cercariae but on careful examination of the tissues, an average of only 4.8 metacercariae per snail was found in the tissues, but there were large numbers of mature sporocysts. The second group was accidentally exposed to free cercariae though they themselves had not been seen to be hosts. Dissection showed that they contained no sporocysts but there was an average of 1,912 metacercariae present in the tissues. P.A.C.

(j) Lucker has successfully transmitted *Gongylonema scutatum* of ruminant origin to pigs, white rats, guineapigs and rabbits, using *Blatella germanica* as intermediate host.

A large proportion of the larvae administered to the pigs were recovered as adult mature worms; only some of the worms recovered from the other hosts were mature. Transmission experiments with two dogs, two chickens and a white mouse were unsuccessful. Careful measurements were made of the adult worms obtained from the successful experiments and there seems to be no doubt that, as Baylis has already suggested, *G. scutatum*, *G. ransomi* and *G. pulchrum* are specifically identical. P.A.C.

(k) Cort has shown that in the reaction of the host to the presence of hookworms, there is something in addition to the attempt to compensate for the blood losses and other lesions produced by the worms.

There is a host protective reaction, called "self cure" by Stoll in infections with various nematodes and this serves to regulate the size of infections and to protect the host against the injuries of the parasite. This mechanism of resistance can be broken down in certain cases by means of diet, repeated bleeding or by other means.

He differentiates several types of hookworm disease in dogs infested with *Ancylostoma caninum*; (1) Fatal acute disease produced in susceptible puppies by means of heavy single doses or by several repeated doses; (2) Chronic infections occurring in animals which have developed a resistance. The effects of the worms are completely compensated for in this type of disease. This is the usual type in animals brought to the laboratory; (3) Acute disease produced in puppies, causing severe anemia from which puppies can recover by means of some natural protective mechanism; (4) Severe disease which can be produced in resistant animals by breaking down their resistance artificially. This type may be fatal but complete cure can generally be brought about if their resistance is built up again. These types are not, however, completely cut off from one another but there are various intergrades linking up one with another.

The evidence from human infections seems to indicate that a host protective reaction is developed here also. This would explain the relatively light infestation of a community which is repeatedly exposed to fresh infection. The individual heavy infestations which occur in any group are probably to be explained on the basis of complicating factors which serve to reduce the individual resistance. P.A.C.

227—Journal of Preventive Medicine.

- a. MILLER, Jr., H. M. & GARDINER, M. L.—“Passive immunity to infection with a metazoan parasite, *Cysticercus fasciolaris*, in the albino rat.” VI (6), 479-496, 1 pl., 7 tables. [November, 1932.]

(a) Miller and Gardiner show conclusively that passive transfer of the immunity of the rat to infection by oncospheres of *Taenia taeniaeformis* can be effected.

Rats have been protected against infection with *Cysticercus fasciolaris* by intraperitoneal injections of serum from infected rats or from those actively immunized against the worm. Complete immunity persisted for 26 days and in two rats out of four, for 36 days, after injection of immune serum. Serum from infected rats was more effective than that obtained from actively immunized individuals.

P.A.C.

228—Journal of the Royal Naval Medical Service.

- a. WILLOUGHBY, H.—“Treatment of intestinal helminthic infections in man.” XVIII, 112-115. [April, 1932.]

(a) Some of the difficulties in helminth treatment can be overcome by simple precautions and adequate dosage. Willoughby also outlines the essentials of prevention of ankylostomiasis in military camps in endemic areas.

R.T.L.

229—Journal of the Society of Tropical Agriculture.

- a. SUGIMOTO, M.—“On the parasitic nematode (*Eustrongylides tricolor* Sugimoto, 1931) in the proventriculus of the Formosan domestic duck.” IV, 103-116, 4 figs., 1 pl., 32 refs. (In Japanese: English summary.)

(a) *Eustrongylides tricolor* which was named by Sugimoto in 1931 from tubercles in the proventriculus of the domestic duck at Taihoku is now further described and differentiated from the three other species of the genus.

R.T.L.

230—Journal of the South African Veterinary Medical Association.

- a. MÖNNIG, H. O.—“New strongylid nematodes of antelopes (Preliminary notes).” III (4), 171-175. [December, 1932.]

(a) Mönnig gives brief preliminary diagnoses of 9 new nematodes. *Trichostrongylus thomasi*, *Bigalkea sabie*, *Cooperia hamiltoni* and *Pneumostrongylus calcaratus* from the Impala (*Aepyceros melampus*), *Cooperia neitzi* from the Koodoo (*Strepsiceros strepsiceros*), *Cooperia verrucosa*, *Cooperia africana* and *Oesophagostomum walkeri* from the Eland (*Taurotragus oryx*) and *Oesophagostomum africanum* from the Springbuck (*Antidorcas marsupialis*) are the species described.

The new genus *Pneumostrongylus* has large lateral lobes but no dorsal lobe to the bursa. Dorsal ray is very short, bent in under the body and ends in a few papillae. Ventral rays are close together, anterolateral diverge from fused medio- and postero-laterals; externo-dorsals arise separately. The spicules are equal, stout, expanded and pigmented. Gubernaculum is absent but the telamon is strongly developed. Eggs when laid are segmenting. The type species is *P. calcaratus*.

R.T.L.

231—Journal of Tropical Medicine and Hygiene.

- a. ARCHIBALD, R. G. & MARSHALL, A.—“A descriptive study of the cercaria of *Schistosoma mansoni* in the Sudan.” xxxv (17), 257-259. [1st September, 1932.]
- b. JEWELL, N. P.—“Schistosomiasis.” xxxv (21), 326-328. [1st November, 1932.]
- c. BIGGAM, A. G. & GHALIOUNGUI, P.—“Hexyl-resorcinol in the treatment of *Ancylostoma duodenale* infection.” xxxv (23), 353-354. [1st December, 1932.]

(a) Archibald and Marshall infected monkeys in the Sudan with *Bilharzia mansoni* by using cercariae derived from experimentally infected *Planorbis alexandrinus* and *P. herbei*.

Eight weeks were required for development in the molluscs. The cercariae are described in detail. There are five pairs of penetration glands, three pairs of flame cells and two pairs of ciliated areas in the body and an additional pair of flame cells in the tail.

R.T.L.

(b) A case of heavy infection with Schistosomiasis is described from East Africa by Jewell. It showed (i) irritation of the skin after bathing, (ii) irregular fever, (iii) dysentery of the amoebic type, (iv) cough, (v) urticaria, (vi) cyanosis and (vii) high eosinophilia.

R.T.L.

(c) Biggam and Ghalioungui have treated 50 carefully controlled cases of *A. duodenale* with hexyl-resorcinol.

The results are not altogether satisfactory as only 26 cases were completely cured even though every care was observed over the diet and when doses of the drug as heavy as 2 grammes were employed. These results contrast strongly with those of other workers but the reason may lie in the fact that in these cases the worm was not *Necator americanus*. No toxic symptoms were observed among the patients and the authors suggest that the drug may be of use as a preliminary treatment in very intense infestations before the regular treatment.

P.A.C.

232—Journal of the Washington Academy of Sciences.

- a. COBB, N. A.—“Nematosis of a grass of the genus *Cyanodon* [= *Cynodon*] caused by a new nema of the genus *Tylenchus* Bast.” xxii (9), 243-245, 3 figs. [1932.]
- b. STEINER, G. & BUHRER, E. M.—“The male of the nematode species *Neotylenchus abulhosus* Steiner, and its sexual dimorphism.” xxii (16, 17), 482-484, 1 fig. [1932.]
- c. STEINER, G.—“Annotations on the nomenclature of some plant parasitic nematodes.” xxii (18/19), 517-518, 10 refs. [1932.]

(a) Cobb describes the occurrence, morphology and pathogenic effects of *Tylenchus tumefaciens* n. sp. a gall-forming parasite of lawn grass in Pretoria, and suggests methods by which the spread of the parasite may be checked.

Within small green or reddish galls on the stem and leaves numerous adult worms and innumerable larvae and eggs are found. The plants are killed by the parasites. The morphology of adult males and females is described in detail and given in formula. Burning of the tops of

the grass after spraying with an inflammable liquid, avoidance of seed and cuttings from infested areas and recleaning of suspected seed are methods recommended for the control of this pest.

M.J.T.

(b) Steiner and Buhrer describe the morphology of the male of *Neotylenchus abulbosus*, hitherto unknown, from a single specimen.

The head shows the 8 sectors typical of the female, the oesophagus lacks a bulb and the cuticular annulation is faint except on the bursa. The bursa is well marked but without rays. The spicules are small but resemble those of *T. dipsaci*. Some measurements are given. The most striking feature in the male is the reduction of the spear, of which only a small portion in the lip region remains. Two larvae with similarly reduced spears were found.

M.J.T.

(c) Steiner points out, with reference to his previous suggestion of raising the subgenus *Pathoaphelenchus* Cobb, 1927, to generic rank that *Aphelenchoides* Fischer, 1894 antedates *Pathoaphelenchus* Cobb, 1927 and therefore replaces it.

Aphelenchoides parietinus (Bastian) Fischer, 1894 is the type of this genus, of which *Aphelenchus modestus* de Man, 1876, *Tylenchus gracilis* Cobb, 1888, *Aphelenchus ormerodis* Ritzema Bos, 1891, and *Aphelenchoides kühnii* Fischer, 1894 are synonyms. It is also pointed out that *Tylenchus gulosus* Kühn, 1889 and Fischer, 1894, is a synonym of *Tylenchus pratensis* de Man, 1884, which adds a number of plants to the host list of the latter.

M.J.T.

233—Klinische Wochenschrift.

- a. FÜLLEBORN.—“Klinik und Bekämpfung der Spulwurminfektion.” II (40 & 41), 1679-1684, 1716-1720. [1st October, 1932.]

(a) Fülleborn gives a detailed account of the clinical features, diagnostic methods and therapeutics of human ascariasis.

The worms have been shown radiographically to lie motionless in longitudinal bundles in the jejunum, their normal abode. In lower parts of the intestine they are very mobile and become knotted, causing obstruction. Abnormal locations and penetration are discussed, as are also the nutritional, toxic and allergic aspects of the infection. Cutaneous reactions are of little value but where used it is important to prepare antigen from the human or pig ascaris: the horse ascaris has a toxic effect.

Oil of chenopodium, or its active component Ascaridol, is preferable to Santonin as an ascaricide, and is harmless to children if correctly used. Carbon tetrachloride and tetrachlorethylene are not satisfactory alone, but the former can be combined with chenopodium, especially in multiple infections with hookworm.

B.G.P.

234—Medical Journal of Australia.

- a. KELLAWAY, C. H. & FAIRLEY, K. D.—“The clinical significance of laboratory tests in the diagnosis of hydatid disease.” 19th Year, I (10), 340-342, 3 text-figs. [5th March, 1932.]

(a) Kellaway and Fairley describe the tests now applicable to cases of suspected infection with Hydatid.

They point out that diagnostic puncture of a cyst is contra-indicated because of the risk of anaphylaxis, of secondary echinococcosis and of rupture into the bronchial passages in lung infestation. Over 300 eosinophiles per cubic millimetre of blood are found in about 50 per cent. of the patients before operation. The Casoni or intradermal test gives a positive immediate reaction in about 75 per cent. of patients prior to their first operation for hydatid. The absence of immediate response correctly indicates freedom in at least 95 per cent. of those tested. The reaction may persist for years after operation in the absence of reinfection. The complement fixation test is specific and failure may result from previous complete degeneration or from rupture or suppuration of a cyst.

R.T.L.

235—Medicina de los Países Cálidos.

- a. LOPEZ-NEYRA, C. R.—“Tumores y gusanos parásitos.” V (5), 429-433. [September, 1932.]

(a) Lopez-Neyra has written a critical review of recent literature on the relationship of neoplasms and parasitic worms, including papers by Brumpt, Sorour, Hougland, Massia & Morenas, Chuen, Larrouse, Bullock & Curtis, Dévé, Vogel and Gheorghill.

B.G.P.

236—Mémoires de l'Université de Neuchâtel.

- a. FUHRMANN, O.—“Les ténias des oiseaux.” No. 8, 1-382, 147 figs., bibliography 25 pp. [1932.]

(a) Since Fuhrmann published his “Cestoden der Vögel” in 1908 our knowledge of the tapeworms of birds has been greatly increased. To-day there are 136 genera in place of 64 and instead of 495 species there are now known 875 found in more than 850 avian hosts.

The present monograph succinctly describes the generic characters and lists the various species. There is a very extensive host list and a bibliography supplementary to that issued in 1908. Two new genera *Baeriella* (for *B. proterogyna* t. sp., n. sp.) and *Paricterotaenia* (for *Choanotaenia* Fuhrmann 1907) are erected and new specific names are proposed for five preoccupied names, viz., *Choanotaenia southwelli*, *Diorchis jacobii*, *Hymenolepis joyeuxi*, *H. lintonella* and *H. woodsholei*.

R.T.L.

237—National Poultry Journal.

- a. HAMILTON, H. P. & BLOUNT, W. P.—“Studies on fowl paralysis. The relationship between intestinal parasitosis and fowl paralysis.” II (4), 150-154. [19th February, 1932.]

(a) Hamilton and Blount discuss the part played by intestinal parasites in the production of fowl paralysis.

They examined 67 fowls which had definitely died of the disease and summarize the prevalence of coccidia, *Heterakis papillosa*, *Davainea proglottina* and *Ascaris lineata*. None of these parasites was present in all the cases but

coccidia were the most frequent and usually the dominant parasite in mixed infections. They infer that no intestinal parasite is directly responsible for the production of the disease, but are of the opinion that all states which lower the vitality of the host are predisposing factors in its production. From this point of view then, coccidia assume some importance but they also mention general malnutrition and heavy helminth parasitosis as being important on occasions. They mention the theory postulated by McGaughey and Dalling which considers a filterable virus as being the real etiological factor in fowl paralysis.

P.A.C.

238—Nederlandsch-Indische Bladen voor Diergeneeskunde.

- a. ANON.—“Korte gegevens over de geschiedenis der Trichinosis in Nederlandsch-Indië.” XLIV (5), 467-469. [October, 1932.]

(a) The outstanding events in the discovery of *Trichinella spiralis* in Sumatra in pigs and dogs (and experimentally in rats), since it was first found in pigs in 1929, are briefly noted. The absence of human cases may be associated with a biological difference in the parasite in the Dutch East Indies.

B.G.P.

239—New Zealand Journal of Science and Technology.

- a. CLARK, A. F.—“The pine-bark beetle, *Hylastes ater*, in New Zealand.” XIV (1), 1-20, 15 figs., 11 refs. [August, 1932.]

(a) Clark briefly records the occurrence of nematodes (undetermined species) within and upon *Hylastes ater* Payk. and considers the relationship one of commensalism rather than of parasitism.

Besides occurring amongst the frass in the beetles' feeding-tunnels the worms are encountered in the hind gut of the insects and, in large numbers, under the elytra but not within the body cavity.

The bulk of the paper deals with the morphology, life history and bionomics of the beetles, the damage they do and preventive and control measures.

J.N.O.

240—North American Veterinarian.

- a. CHRISTENSON, R. O.—“An epizootic in wild geese due to nematode and fungous infections.” XIII (11), 57-59, 1 fig., 5 refs. [November, 1932.]

(a) According to Christenson, parasitic worms are frequently considered to be a lethal factor when more accurate post mortem work will show up more serious disease.

He had the opportunity of carrying out post mortems on 44 geese, being 76 per cent. of the entire flock. The birds died after a prolonged sickness showing symptoms of emaciation, weakness and lung involvement. The examination showed the presence of three lethal diseases:—*Cyathostoma bronchialis* in the trachea; *Aspergillus fumigatus* forming tuberculous-like masses in the lungs and air sacs; *Amidostomum anseris* in the lining of the gizzard. From the degree of infestation of each parasite Christenson inferred

that in most cases, death was due to the presence of the fungus though the gape worms were generally the most obvious parasite present. In a few cases there was a heavy infestation of gizzard worms and he then invokes this as the lethal factor—the other two parasites being predisposing agents. P.A.C.

241—Okayama-Igakkai-Zasshi.

- a. SHIGENOBU, T. & HIROMOTO, T.—“Ueber die Veränderungen der Senkungsgeschwindigkeit und der Resistenz der Erythrozyten bei der experimentellen Clonorchiasis sinensis bei Kaninchen.” XLIV (7), 1866-1878. (In Japanese: German summary, p. 1866.) [July, 1932.]

(a) Shigenobu and Hiromoto have investigated variations in the rate of sedimentation, and in the resistance [to haemolysis, apparently], of red blood cells in experimental Clonorchiasis sinensis in rabbits.

The 24 hour sedimentation rate [presumably measured by depth of clear serum] increases during the first week or so of the disease from the normal 25 mm. to as much as 40.5 mm. in one case, and then rapidly falls off until, just before death, the corresponding values lie between 4.5 and 9.5 mm. Values after 1, 2, 3, 6 and 24 hours of sedimentation are given in the tables (pp. 1868-1869). Resistance also shows a preliminary increase followed by a sharp decline. B.G.P.

242—Oyo-Dobuts.-Zasshi.

- a. IMAMURA, S.—“Mermithidae parasitic in *Chilo simplex* and leafhoppers.” IV (2), 73-78, 7 figs. [May, 1932.]

(a) Imamura records *Amphimermis zuimushi* Kaburaki & Imamura, 1932, attacking the larvae of the rice borer, *Chilo simplex* Butler. 76.22 per cent. of the larvae are parasitized in Japan. J.N.O.

243—Parasitology.

- a. HARPER, W. F.—“On some British larval trematodes from terrestrial hosts.” XXIV (3), 307-317, 13 figs., 4 tables, 10 refs. [October, 1932.]
 b. GOGATE, B. S.—“On a new species of trematode (*Prohemistomum serpentum* n. sp.) from a snake, with a note on an immature species of *Heterochinostomum* Odhner from the cat.” XXIV (3), 318-320, 2 figs., 6 refs. [October, 1932.]
 c. STUNKARD, H. W.—“Some larval trematodes from the coast in the region of Roscoff, Finistère.” XXIV (3), 321-343, 13 figs., 33 refs. [October, 1932.]
 d. ARCHIBALD, R. G. & MARSHALL, A.—“A study of some cercariae obtained from molluscs in the Sudan.” XXIV (3), 344-349, 1 pl. [October, 1932.]

(a) Harper gives descriptions of five cercariae from Scottish terrestrial molluscs, viz., *Helix hortensis*, *Polita alliaria*, *P. nitidula*, *P. lucida*, and *Lauria cylindracea*. The parasite of the first-named mollusc is *Cercariaeum helici* Braun, the four other cercariae are given trinominal names and are described as new species. R.T.L.

(b) In *Natrix piscator* at Rangoon, Gogate has found a new species *Prohemistomum serpentum*. The vitellaria are confined to the adhesive apparatus as in *P. industrium* but the eggs in the uterus are limited to one or

two. The occurrence in a cat of immature specimens of *Heterochinostomum magnovatum* previously recorded by Stunkard & Haviland in a rat is noted. There are 24 spines on the collar. R.T.L.

(c) During August 1931 Stunkard examined for cercariae large numbers of marine snails at Roscoff, Finistère, and encysted metacercariae were sought in various invertebrates notably worms and crustaceans. Seven species of cercariae of which four are new and four metacercariae of which two are new are described in this paper. R.T.L.

(d) Five different cercariae found in Sudanese freshwater molluscs are figured and described by Archibald and Marshall. The hosts are *Physopsis didieri*, *P. globosa*, *Bulinus contortus* and *B. truncatus*. The two types in *B. truncatus* are both furcocercous. R.T.L.

244—Philippine Agriculturist.

- a. BONCATO, P. C.—“A study on the efficiency of the different methods for controlling stomach and intestinal worms in sheep and goats.” XX (10), 669-677, 3 tables. [1932.]

(a) According to Boncato sheep and goats in the Philippines suffer more from internal parasites than from any other ailment. The relative efficacy of measures of control based on (i) feeding with concentrated food and (ii) drenching with CuSO_4 and CuSO_4 + Nicotine were investigated. The parasites which occurred in the experimental animals were *Haemonchus contortus*, *Oesophagostomum columbianum*, *Bunostomum* sp. and *Moniezia expansa*. The best results in promoting good health and in reducing the parasitic infestation were obtained from a mixture of grain in the proportion by weight of 8 parts of shelled corn, five of copra meal, one of rice bran, in amounts which the animals could consume readily every evening. Copper sulphate solution (1.47 per cent. by weight) and copper sulphate-nicotine (equal parts by volume of the CuSO_4 solution and a solution of nicotine 10.7 per cent. by weight) were administered at weekly and 21 day intervals. The doses of each were 20 cc. under 3 months old, 40 cc. at 6 months, 60 cc. for yearlings and over 2 years 90 cc. Both proved less satisfactory in lowering infestations and in preventing losses. On the basis of egg counts these two solutions had similar effects in reducing the degree of parasitism. It is stated that all the animals (2 sheep and 2 goats in each experiment) were allowed to run with the main herd. They had access to a variety of vegetation in the pasture in the day-time and were quartered indoors at night. As far as possible the animals were rotated in the different pastures to prevent the rapid multiplication of parasites in any place. R.T.L.

245—Philippine Journal of Science.

- a. TUBANGUI, M. A.—“The molluscan intermediate host in the Philippines of the oriental blood fluke *Schistosoma japonicum* Katsurada.” XLIX (2), 295-304, 5 pls., 1 table, 14 refs. [October, 1932.]

(a) Tubangui has investigated the prevalence of *Schistosoma japonicum* and its carrier in the Philippines and reports that *Blandfordia quadrasi* occurs with natural infections near the town of Palo, Leyte, and that mice were afterwards experimentally infected. R.T.L.

246—Phytopathology.

- a. STEINER, G. & BUHRER, E. M.—“The nonspecificity of the brown-ring symptoms in narcissus attacked by nematodes.” XXII (11), 927-928, 1 fig., 4 refs. [November, 1932.]

(a) Steiner and Buhrer state that *Aphelenchoides fragariae* and *A. parietinus*, *Aphelenchus avenae* and *Cephalobus striatus* may produce or be connected with brown rings in narcissus bulbs, similar to those characteristic of *Tylenchus dipsaci* attack.

None of these nematodes is so highly pathogenic as *T. dipsaci* although the brown rot appears in the neck and spreads downwards in much the same manner as in *T. dipsaci* infections. *Cephalobus striatus* seldom occurs and is possibly only saprophytic, attacking tissue which has suffered damage through faulty hot water treatment. M.J.T.

247—Porto Rico Journal of Public Health and Tropical Medicine.

- a. HALL, M. C.—“Specific anthelmintic medication.” VIII (1), 35-68. [September, 1932.]

(a) Hall usefully summarizes present-day knowledge of the various anthelmintics under the headings dosage, purgative, other measures, action of drug and contraindications. R.T.L.

248—Poultry Science.

- a. LAKELA, O.—“Chickens definitive hosts to species of *Prosthogonimus*.” XI (3), 181-184, 4 figs. [1932.]

(a) Lakela has confirmed the findings of Kotlan & Chandler (1927) and Szidat (1926) that dragonfly nymphs are intermediate hosts for species of *Prosthogonimus* in poultry.

Nymphs of the genus *Tetragoneuria* were fed to young chicken and ducklings, and to mature birds. The latter were infected in the oviducts, and the former in the bursa fabricii of both sexes. In the young poultry the flukes were smaller, especially in ducklings where they were very slow in reaching sexual maturity. The fluke most closely resembled *P. pellucidus*. B.G.P.

249—Praktika de l'Académie d'Athènes.

- a. PANTAZIS, G.—[Ratten und Rattenflöhe der Stadt Athen.] VII, 96-100, 2 figs. (In Greek: German summary.) [10th March, 1932.]

(a) In the course of a paper on the rats and rat-fleas of Athens, Pantazis reports that 17 per cent. of 2,197 rats harboured *Hymenolepis diminuta*. Most of the rats were *Rattus norvegicus* and the rest *R. alexandrinus*: *R. rattus* has not been encountered. B.G.P.

250—Proceedings of the Imperial Academy, Tokyo.

- a. KABURAKI, T. & IMAMURA, S.—“A new mermithid-worm parasitic in the rice borer, with notes on its life history and habits.” VIII (3), 109-112, 6 figs. [1932.]

(a) *Amphimermis zuimushi* n.g., n.sp. is recorded from the rice borer, *Chilo simplex* Butler, in the district of Numazu near Shizuoka, Japan, parasitizing 76.22 per cent. of the insects and thus exercising a considerable extent of biological control.

A technical description of the parasite is given and the authors consider it to represent a new genus and species although closely allied to *Mermis elegans* Hagmeier, 1912. Amongst the notes on the life history and habits of the worms it is of interest to note that infestation mostly occurs in the second generation of the rice borer, which has two cycles in a year, and that death of the host results from the escape of the parasite. Great similarity with certain other parasites, e.g. *Mermis subnigrescens* Cobb, 1926, is exhibited in the fact that in cases of very low parasitism per individual the nematodes are all females while the higher the parasitism per individual the more conspicuous is the appearance of males. J.N.O.

251—Proceedings of the Society for Experimental Biology and Medicine.

- a. MILLER, Jr., H. M.—“Therapeutic effect of specific immune serums against a metazoan parasite (*Cysticercus fasciolaris*).” Preliminary paper. *xxx* (1), 82-83. [October, 1932.]
- b. MCCOY, O. R.—“Experimental Trichiniasis infection in monkeys.” *xxx* (1), 85-86. [October, 1932.]
- c. BROWN, H. W.—“Treatment of pin worm (*Enterobius vermicularis*) infestation with Hexylresorcinol.” *xxx* (2), 221-224. [November, 1932.]

(a) Miller found that serum from rats immune to *Cysticercus fasciolaris* inhibited the growth of the larva in non-immune rats.

Non-immune rats were fed water containing onchospheres by means of a stomach tube. At varying intervals afterwards, pooled serum from rats infected with *C. fasciolaris* was injected intraperitoneally. There were two control groups—one received normal rat serum and the other received nothing. At autopsy 28 days later cysts were almost completely absent from the experimental group while both the control groups contained numbers of large cysts varying from 3-6 mm. in diameter. When the first intraperitoneal injection was made more than 9 days after feeding the onchospheres, there was very little inhibition. P.A.C.

(b) Seven species of South American monkeys were experimentally infected with *Trichinella spiralis* but the symptoms of fever, oedema and marked eosinophilia, which characterise trichiniasis in man, did not develop. Death occurred in from 3 to 41 days depending upon the dose. Doses of 5 larvae or more per gm. of body weight were invariably fatal. Each female was computed to produce about 1,500 larvae. Only partial immunity resulted from repeated infections. R.T.L.

(c) Brown has successfully treated human infestations of *Enterobius vermicularis* with hexylresorcinol.

He finds that the most successful method is to combine oral administration of the drug with an enema. He used crystalline hexylresorcinol pills orally,

using 0.1 gm. per year of age up to 10 years: the maximum dose being 1.0 gm. He combined this with a soapsuds enema, followed by a high enema of 1 part crystalline hexylresorcinol in 1,000 ccs. of water. Five out of six people thus treated were completely cured. Other cases treated either with an enema or orally gave less satisfactory results. P.A.C.

252—Proceedings of the United States National Museum.

- a. ALICATA, J. E.—“A new trematode of the genus *Urotrema* from bats.” LXXXI (Art. 5), 1-4, 1 fig., 1 table, 3 refs. [1932.]
- b. PRICE, E. W.—“The trematode parasites of marine mammals.” LXXXI (Art. 13), 1-68, 12 pls., 8 pages of refs. [1932.]
- c. CHANDLER, A. C.—“Notes on the helminth parasites of the opossum (*Didelphis virginiana*) in Southeast Texas, with descriptions of four new species.” LXXXI (Art. 16), 1-15, 5 figs., 15 refs. [1932.]

(a) A new species of *Urotrema*, the first recorded for the United States, is described by Alicata from *Lasiurus borealis*. *U. lasiurensis* n. sp. is intermediate between *U. scabridum* Braun, 1900, and *U. shillingeri* Price, 1931. R.T.L.

(b) Price has monographed the 30 recognizable species of Trematodes found in 29 species of marine mammals.

A new genus *Hadwenius* is created for *H. seymouri* n. sp. from the White Whale. It is a Campulinae closely related to *Synthesium* but differs in the rosette formation of the vitellaria and in the vagina being unarmed. *Monostomum dujonis* Leuckart, 1874, and *Cochleotrema cochleotrema* Travassos & Vogelsang, 1931, are placed in the genus *Opisthotrema*. R.T.L.

(c) Chandler describes 7 species of helminths, of which 4 are new, from a series of opossums (*Didelphis virginiana*) caught in the vicinity of Houston, Texas, U.S.A.

The trematode forms found are *Proalaria variabilis* n. sp., *Harmostomum opisthotrias* (Lutz, 1895) and *Rhopalias macracanthus* n. sp. The first species, from the small intestine, is shown to be specifically distinct, despite the wide variation in form, from *Neodiplostomum lucidum* from the same host and locality. The second species, previously reported from Brazil and Virginia, also varies considerably, especially in size, but the author considers the species of intermediate host in the three regions may have some influence on dimensions. The third fluke may be differentiated from the three hitherto described forms of *Rhopalias*, all from S. American opossums, by size, proportions of anterior and posterior divisions of the body and size and armature of the proboscides.

The nematode forms found are *Aspidodera harwoodi* n. sp., *Cruzia tentaculata* (Rudolphi, 1819), *Physaloptera (Turgida) turgida* Rudolphi, 1819 and *Gnathostoma didelphis* n. sp. The first form, from the caecum, is separable from the 5 hitherto described species, all from the S. American opossums and edentates, by the number and arrangement of the caudal papillae of the male tail and by the difference in spicule lengths. The last species, described from sexually immature forms from the liver, is shown by the number of caudal papillae to be distinct from *G. turgidum* parasitic in *Didelphis azarae* in Argentina and *D. aurita* in Brazil. J.N.O.

253—Queensland Agricultural Journal.

- a. ROBERTS, F. H. S.—“A survey of the helminth parasites of the domestic fowl and domestic pigeon in Queensland.” xxxviii (4), 344-347, 6 refs. [October, 1932.]
- b. CAREW, J.—“Sheep parasites and diseases.” xxxviii (5), 438-453, 7 pls. [November, 1932.]

(a) Five species of tapeworms and seven species of nematodes in the domestic fowl and one cestode and three nematodes in the domestic pigeon were collected by Roberts from 128 birds chiefly from the Brisbane District. The 15 species are briefly annotated and 9 have been recorded by previous workers. R.T.L.

(b) J. Carew states that in Queensland *Haemonchus contortus* is responsible for the most loss in sheep especially in coastal, semicoastal and plateau areas. The various methods of treatment of Haemonchosis, Oesophagostomosis and Moniezia are briefly discussed. Carew reports that during 1932 heavy losses among sheep running on light forest or trap-rock country occurred after drenching with carbon tetrachloride. R.T.L.

254—Report of the Director of the Institute of Animal Pathology, Cambridge. (Second Report 1931).

- a. STEWARD, J. S.—“Some nematode parasites of the British fallow deer (*Dama dama*).” pp. 198-199, 4 refs. [1932.]
- b. STEWARD, J. S.—“A list of parasites examined during the year.” pp. 200-203. [1932.]
- c. WOOD, W. A.—“Experiments on the treatment of parasitic gastro-enteritis in sheep and lambs.” pp. 204-212, 4 refs. [1932.]
- d. WOOD, W. A.—“Some notes on the treatment of equine strongylosis with oil of chenopodium.” pp. 213-219, 6 tables. [1932.]
- e. WOOD, W. A.—“A note on the size of the eggs of some species of sheep worms.” pp. 220-222, 1 table, 3 charts, 1 ref. [1932.]

(a) Steward records for the first time in Britain *Oesophagostomum venulosum*, *Cooperia oncophora*, *Nematodirus* sp. [?] and *Capillaria* sp. [?] in *Dama dama* in Herefordshire. R.T.L.

(b) Steward's list of partially identified specimens deals mostly with species of common occurrence in heterogeneous collections of mammals, birds and fishes. R.T.L.

(c) Eight experiments to test the anthelmintic action of various drugs on parasitic roundworms in the gut of sheep are recorded by W. A. Wood.

The drugs used were (1) santonin, (2) oil of chenopodium, (3) iodine, (4) copper sulphate and mustard, (5) copper sulphate, sodium arsenate and mustard, (6) carbon tetrachloride, (7) rectified benzole and (8) copper methyl arsenate. The results varied greatly in individual sheep. In every case *Haemonchus* were found on post-mortem. The reduction in the number of eggs passed is noted in most of the experiments but the identification of the adults found is given only in the case of the last experiment. The author concludes that test No. 4 did not show satisfactory results, No. 5 gave good results but the long fast was a disadvantage. Test (6) showed

that in doses of 5 cc. carbon tetrachloride was the most efficient drug used. With test No. 8 the results were variable but on the whole good. R.T.L.

(d) Wood gives an account of experiments on horses which show that oil of chenopodium is a very useful and apparently safe means of getting rid of strongyles, trichonemas and allied species. Good results followed the administration of "saline solution" immediately after the chenopodium. When purgation was marked the results were not so good. The dose for horses of 3 years old and over is from 4 to 6 drachms and for foals over six months 1 drachm. The animals used were either hunters or thorough-breds. R.T.L.

(e) From a comparison of the sizes of their eggs W. A. Wood concludes that, with one or two exceptions, the species of nematode worms harboured by a particular sheep cannot be determined. R.T.L.

255—Report of the Porto Rico Agricultural Experiment Station, 1931.

a. VOLKENBERG, H. L. VAN.—"Report of the Parasitologist." pp. 24-27, 1 fig. [1932.]

(a) Van Volkenberg records the water beetle, *Tropisternus collaris*, as a new and locally important intermediate host of *Macracanthorhynchus hirudinaceus* of swine. He also reports that, although livestock was relatively free from most parasites owing to the dry weather, liver fluke in cattle was normally prevalent. Calves fed on grass from margins of a ditch that had been dry for 6 months became infected, hence the usual control-measures (drainage, molluscicides) should be accompanied by ploughing to remove encysted cercariae. B.G.P.

256—Revue Suisse de Zoologie.

a. BAER, J. G.—"La pathogénie de quelques helminthiases." XXXIX (7), 251-260. [May, 1932.]

(a) Baer usefully reviews from the comparative viewpoint the various kinds of host reactions to helminth infections. The subject is considered succinctly under the headings (i) humoral reactions, (ii) tissue reactions, (iii) ulceration, (iv) formation of diverticula, (v) perforation of the intestinal wall, (vi) inflammatory lesions, (vii) hyperplasia, (viii) cancerous lesions. R.T.L.

257—Rinnovamento Medico.

a. CASTRONUOVO, G.—"Distomatosi e bilharziosi." (Sez. VII), v (1), 3-22, 23 figs. [31st January, 1932.]

(a) Castronuovo has given a general differential account of human distomiasis and schistosomiasis. After a brief note on morphology and life-history, distomiasis is considered under the following varieties: (i) buccopharyngeal, (ii) intestinal, (iii) hepatic, (iv) pulmonary; and schistosomiasis

under (i) urino-genital and (ii) intestinal. Each section is subdivided under such headings as pathogenesis, diagnosis, prophylaxis, treatment, etc. The article is illustrated with drawings showing the morphology of the various trematodes.

B.G.P.

258—Science.

- a. NOBLE, W. & SMITH, S.—“*Hasstilesia tricolor* Stiles and Hassall, 1894. A new report.” LXXVI (1966), 216. [2nd September, 1932.]

(a) Noble and Smith record the nematode *Hasstilesia tricolor* from the wild rabbit in Alabama.

R.T.L.

259—Scientific Agriculture.

- a. CONKLIN, R. L.—“The gizzard worm in Quebec.” XIII (2), 126, 1 pl. [October, 1932.]
b. BAKER, A. D.—“Records of distribution of internal parasites of poultry in the province of Quebec.” XIII (2), 127-130, 3 pls. [October, 1932.]

(a) Conklin records the presence of *Cheilospirura hamulosa* from the gizzard of the domestic fowl in Quebec.

The worm does considerable damage and lives in tunnels excavated in the muscular layers causing a local necrosis of the mucosa. A photograph of a worm *in situ* is given.

T.W.M.C.

(b) Baker records the distribution of various parasites of poultry in Quebec, giving also brief descriptions of the various forms seen.

The following species were observed and are recorded by localities within the province: *Eimeria avium* (s.l.), *Ascaridia lineata*, *Heterakis gallinae*, *Capillaria meleagris-gallopavo*, *Cheilospirura hamulosa*, *Amoebotaenia sphenoides*, *Davainea proglottina*, *Railletina cesticillus*, *Hymenolepis carioeca* and *Choanotaenia infundibulum*.

T.W.M.C.

260—Scientific Proceedings of the Royal Dublin Society.

- a. BUTLER, J. B. & HUMPHRIES, A.—“On the cultivation in artificial media of *Catenaria anguillulae*, a Chytridiacean parasite of the ova of the liver fluke, *Fasciola hepatica*.” XX (n.s.) (25), 301-324, 6 pls., 49 refs. [August, 1932.]

(a) Bayley Butler and Humphries describe the preparation and use of four media on which *Catenaria anguillulae* was successfully cultured; in one medium the zoospores germinated and the life cycle was completed. Agar agar, specially prepared flaked coagulated egg-albumen and extract of fluke-ova were the constituents of the media. The most successful cultures were made by placing infected ova in hanging drop preparations of equal quantities of water, agar agar and an extract of fluke-ova prepared by adding 2 cc. of water to 2 cc. of ova which had been dried in a desiccator and then ground with kieselguhr in an agate mortar, shaken and centrifuged. Mycelial growth took place rapidly in this medium, and numerous sporangia were formed, liberating zoospores which germinated, producing a comparatively complex thallus and zoosporangia.

Resting spores were found in two cases only. The extensive development of the mycelium under cultural conditions is considered to support the view that *C. anguillulae* is a form reduced by parasitism. M.J.T.

261—Scottish Forestry Journal.

- a. LAIDLAW, W. B. R.—“The enemies of the elm bark beetle (*Scolytus destructor*, Oliv.).” XLVI (2), 117-129, 6 figs., 10 refs. [October, 1932.]

(a) Amongst the various natural enemies, that occur in Britain, of the large Elm Bark Beetle, Laidlaw mentions the nematode *Parasitylenchus scolyti* Oldham, 1930 which parasitizes the insects.

The effect of the association between beetle and worm, in many cases, is to cause sterility in both sexes of the host, the parasites being confined to the body cavity especially in the region of the reproductive organs. 60 per cent. of the beetle population examined was infested while 40 per cent. was classified as sterile. Mention is also made of *Cylindrogaster ulmi* Goodey, 1930, a free-living nematode found externally on beetle pupae and adults.

Coleopterous predators and Braconid and Chalcid parasites are also dealt with as well as the description and life history of the beetles and the damage they do. J.N.O.

262—Sitzungsberichte der Gesellschaft Naturforschender Freunde zu Berlin.

- a. NÖLLER, W.—“Weitere Untersuchungen über Parasitenbefunde bei Landschnecken von Thüringer Schafweiden in einem Lanzertegelgebiete.” Year 1932 (1'3), pp. 3-62, 2 figs., 32 refs. [July, 1932.]

(a) Nöller has reviewed at length recent work on the life-history of *Dicrocoelium dendriticum*, especially his own numerous experiments, as a result of which he claims to have increased the probability that *Cercaria vitrina* is a stage of this fluke.

Negative feeding-experiments on mammals are taken to indicate that an auxiliary host is involved, probably an arthropod parasitic in the snails. No mollusc other than *Zebrina detrita* has been implicated with the doubtful exception of *Agriolimax agrestis*. B.G.P.

263—Taiwan Igakkai Zasshi.

- a. KAWANISHI, K.—“Experimental studies on the entrance of bacteria incidental to percutaneous infection of the human body with hookworm.” (Translation from Japanese text.) XXXI (8), 82. [August, 1932.]
 b. NARITOMI, C.—“Ein weiterer Fall von *Sparganum mansoni* auf ophthalmologischem Gebiet.” (German translation from Japanese text.) XXXI (8), 83. [August, 1932.]
 c. KAWANISHI, K.—“Experimental studies on the morphological changes of the blood in percutaneous infections with *Necator americanus* of man.” (Translation from Japanese text.) XXXI (9), 91-92. [September, 1932.]
 d. KAWANISHI, K.—“Experimental studies on the morphological changes of the blood and clinical symptoms in infections with *Taenia solium* of man.” (Translation from Japanese text.) XXXI (9), 93-94. [September, 1932.]

- e. KAWANISHI, K.—“Versuchte Hervorrufung einer Hautreaktion durch Einimpfung der Körpersubstanz des Bandwurms.” (German translation from Japanese text.) xxxi (9), 94. [September, 1932.]
- f. YOSHINO, K.—“Clinical observations on 25 cases of *Strongyloides stercoralis* in the Yaeyama Archipelago.” xxxi (10), 99. [October, 1932.]

(a) Kawanishi recently carried out the percutaneous infection of three human beings with *Necator americanus* larvae. In one case there developed at the site of infection abscesses containing *B. coli communis* in pure culture, introduced presumably with the larvae. B.G.P.

(b) Naritomi has found *Sparganum mansoni* in the upper and lower conjunctiva palpebralis of a carpenter. B.G.P.

(c) Kawanishi, in his experimental infection of three persons with *Necator americanus* larvae, observed an exanthema at the site of infection for 2-3 weeks. Ova appeared in the stool after about 60 days. One case showed a slight anaemia, and there was a leucocytosis, maximal after 6-7 weeks, with an eosinophilia of over 50 per cent. Neutrophiles varied in number inversely with the eosinophiles. B.G.P.

(d) After four persons had been infected *per os* with *Cysticercus cellulosae* Kawanishi found that expulsion of tapeworm segments began in about 65 days. Leucocytosis was marked at first but eosinophilia reached only 15 per cent. Neutrophiles showed an increase and lymphocytes a decrease. B.G.P.

(e) Kawanishi found there was no skin-reaction when the skin of a tapeworm carrier was inoculated with the dried pulverized body of a *Taenia solium*. B.G.P.

(f) In the 25 cases of *Strongyloides stercoralis* found by Yoshino there were no well defined symptoms but some were suffering from slight diarrhoea and others from liquid or bloody stools and general weariness, dull appetite, thirst, gastralgia, etc., with later swelling of legs and face and irregular fever. 14 cases had bronchitis as a complication and certain of these were probably due to *Strongyloides* as the larvae occurred in the sputum in three cases. In one of them eggs also were found in the sputum. R.T.L.

264—Tierärztliche Rundschau.

- a. OBER-BLÖBAUM, W.—“Untersuchungen über die Einwirkungen physikalischer Einflüsse auf die Larven von Pferdestrongyliden.” xxxviii (47), 812-815, 10 refs. [20th November, 1932.]

(a) Ober-Blöbaum finds the ensheathed larvae of *Trichonema* spp. and *Strongylus edentatus*, from horses, very resistant to low temperature, immersion in water, and dryness. *Strongylus vulgaris* larvae are less resistant.

After continuous freezing for 4½ months, 6 per cent. of the larvae lived, except those of *S. vulgaris* which were all dead. Intermittent freezing was more quickly fatal. After 8½ months in ice at -6°C. to -12°C. a few larvae survived, but none after 9 months. After 8½ months in tap-water the majority of those larvae which were still ensheathed remained alive.

Larvae dried on glass slides and kept at -6°C. to -12°C. are more resistant than those kept at room temperature (80 per cent. and 60 per cent. respectively survived 9 months). Intermittent damping is fatal within 3 weeks. A temperature of 50°C. is fatal to larvae in water but not apparently to those kept dry. B.G.P.

265—Tijdschrift over Plantenziekten.

- a. STIELTJES, D.—“Aaltjes-proefvelden in West-Overijssel.” XXXVIII (4), 67-69. [April, 1932.]

(a) Stieltjes describes the building up of an eelworm-resistant strain of rye and the effects of various chemical treatments of soil designed to control nematodes.

The selection of resistant plants from one stock followed by interbreeding and further selection was begun in 1929 and is to be continued. No control was obtained with ammonium sulphate and lime; some effect was produced by the use of uspulun; naphthaline gave disappointing results as compared with former experiments. Of other preparations Nematol I proved poisonous to the plants, and the few that survived were heavily attacked by eelworm. Nematol II gave fairly good results when applied before sowing. B242 was so deadly a poison that no plants survived and soil treated with this preparation remained incapable of growing any crop for some considerable time. M.J.T.

266—Transactions of the American Microscopical Society.

- a. LA RUE, G. R. & TOWNSEND, E. W.—“A morphological study of *Alaria nasuae* La Rue and Townsend (Trematoda: Alariidae).” LI (4), 252-263, 2 pls., 1 table, 13 refs. [October, 1932.]
- b. MUELLER, J. F.—“*Capillaria tenua*, a new species of nematode parasitic in the newt, *Triturus viridescens*.” LI (4), 263-266, 1 pl., 12 refs. [October, 1932.]
- c. DOBROVOLNY, C. G.—“A note on cestode technic.” LI (4), 275-276, 3 refs. [October, 1932.]

(a) La Rue and Townsend describe *Alaria nasuae* a trematode from the intestine of *Nasua narica* (Procyonidae). The authors proposed the above name in 1927 in the *Proc. Amer. Soc. Parasitol.*, published in the *Journal of Parasitology*, and here give a full and illustrated description based on sections and an *in toto* mount. *Alaria nasuae* most closely resembles *A. alata* but differs from this and other species in size, size and shape of the holdfast, and arrangement of the uterine coils. B.G.P.

(b) Mueller has described a new species, *Capillaria tenua*, from the intestine of the newt *Triturus viridescens*. The oesophageal chain has 110 cells (nuclear count) which show a misleading superficial segmentation. The spicule sheath is spined. The male is 7.5 mm. by 0.068 mm. (maximum), and the female 10 mm. by 0.096 mm. A list of helminths recorded from this newt is appended. B.G.P.

(c) Dobrovolsky finds that a successful technique for opaque cestode proglottids is fixation in Bouin's fluid so modified as to contain 15-20 parts of acetic acid, staining in dilute Kornhauser's haematein or Delafield's

haematoxylin, clearing in cedar oil, then scraping off the dorsal and ventral cuticular and muscular layers with the dull side of a scalpel. Progressive staining is as good as overstaining and differentiating. B.G.P.

267—Transactions of the Royal Society of Tropical Medicine and Hygiene.

- a. HUMPHREYS, R. M.—“Vesical Schistosomiasis in the Gezira irrigated area of the Sudan.” XXVI (3), 241-252, 6 tables. [November, 1932.]

(a) Humphreys describes the measures taken to prevent the spread of Schistosomiasis in the Gezira, a flat bare plain lying between the White and the Blue Nile at Khartoum.

Over half a million acres of this desert have been irrigated artificially from the Sennar Dam since 1925 and there are now 720 miles of canals. Steps were taken to eliminate the human carrier by treating all infected cases with antimony tartrate. Over 90 per cent. of the cases were found in immigrants and quarantine stations were established at Kosti, Dueim and Wadi Halfa. Every effort was made to prevent the contamination of the canals and a campaign of mollusc destruction was systematically carried out (i) by desiccation and silt removal (ii) by chemical treatment chiefly with “Sizolin” a commercial carbolic liquid in the strength of 1 in 20,000 (iii) by trapping on closely slatted hurdles (iv) by ducks, which were quickly stolen by the cotton pickers. The author discusses the results obtained to date. R.T.L.

268—Veterinary Journal.

- a. WARRACK, G. H. & DALLING, T.—“So-called ‘Fowl Paralysis.’” LXXXVIII (1), 28-43, 17 refs. [January, 1932.]
 b. TAYLOR, E. L.—“Notes on ascaris and lungworms in pigs.” LXXXVIII (10), 438-441. [October, 1932.]
 c. CASTLE, A. F.—“Some clinical notes on pig diseases.” LXXXVIII (10), 474-476. [October, 1932.]
 d. PILLERS, A. W. N.—“Notes on parasites of fur animals and cage birds.” LXXXVIII (12), 543-547. [December, 1932.]

(a) “Fowl Paralysis” is a specific condition for which Warrack and Dalling prefer the term “Lymphomatosis” as cases occur in which paralysis is absent. They affirm that the disease which has been attributed to infection with tapeworms may exist in the absence of intestinal parasites. It can be produced by the injection of suitable sterile tissues from affected cases and is probably due to a filterable virus. R.T.L.

(b) Taylor gives a popular account of recent work advocating sanitation as a means of controlling ascaris and lungworms in pigs. R.T.L.

(c) An outbreak of verminous gastritis in sows due to *Hyostromylus rubidus* is reported by Castle.

The loss of milk and inability to feed their young after a period of 4 or 5 weeks’ lactation resulted in stunted and unthrifty porkers due partly to artificial feeding. Three sows died but eight were killed owing to their extremely emaciated and debilitated condition. R.T.L.

(d) This general paper by Pillers contains a useful summary of the helminths which may be encountered in veterinary practice in small mammals and birds. R.T.L.

269—Veterinary Medicine.

- a. STEINBACH, F. G.—“Additional notes on whipworm elimination.” XVII (11), 480-481. [November, 1932.]

(a) Steinbach notes that whipworm in the dog can be cured by the introduction per rectum of oil of chenopodium in the strength of one drop per pound weight of dog, in a bland oil like cod liver oil or mineral oil. The toxic effects are much less than when given by the mouth. R.T.L.

270—Veterinary Record.

- a. BIELY, J. & PALMER, V. E.—“The etiology of fowl paralysis.” XII (44), 1302-1309, 69 refs. [29th October, 1932.]
b. PURVIS, G. B.—“Cestodes from domestic animals in Malaya, with descriptions of new species.” XII (48), 1407-1409, 3 figs. [26th November, 1932.]

(a) Biely and Palmer review the literature of the last 15 years, which deals with the causative organism of fowl paralysis.

Pathologically the disease is characterized by tumour-like growths on the peripheral nerves and by an encephalo-myelitis. In the earlier literature helminths or coccidia were generally considered as being the causative organisms. In view of more recent work, however, this theory of the parasitic origin of the disease has been almost completely abandoned, though it is generally assumed that such parasites may be predisposing factors in that they secrete toxins and in other ways devitalize the intestines. It seems to be fairly generally accepted now that paralysis is a specific disease and can be transmitted to healthy birds by artificial means; it may exist in the complete absence of all internal parasites. The causal factor is contained in the tissues of affected birds and may be transmitted through the egg. Many authors consider that a filterable virus is the cause and that birds which are suffering from helminthiasis, coccidiosis or malnutrition in any of its many forms, are more susceptible than healthy birds.

There is, however, still a school of thought which does not regard the disease as a specific entity but merely as a symptom of severe intestinal disturbance caused by toxins from coccidia or helminths—in particular cestodes. P.A.C.

(b) In comments upon a short list of identifications Purvis expresses the opinion that *Dipylidium chyzeri* von Ratz, 1897 cannot be distinguished from *D. pasqualei* Diamare, 1893. Two new species of *Raillietina* are described from the common domestic fowl in Malaya, viz. *R. acanthovagina* and *R. southwelli*. Both belong to the subgenus *Paroniella*. The differential characters of its seven species are tabulated. R.T.L.

271—Videnskabelige Meddelelser fra Dansk Naturhistoriske Forening.

- a. BOVIEN, P.—“On a new nematode, *Scatonema wülkeri* gen. et sp. n. parasitic in the body-cavity of *Scatopse fuscipes* Meig. (Diptera nematocera).” XCIV, 13-32, 7 figs. 7 refs. [1932.]

(a) Boven has studied the somewhat remarkable life history of *Scatoneema wülkeri* parasitic in the larvae, pupae and imagines of *Scatopse fuscipes* Meig., a fly breeding in manure and putrescent material and, because of a short life cycle, producing numerous generations per year.

In describing the developmental stages of the nematode the author points out that it is possible to determine the sex of the embryo within the egg from the structure of the developing gonads and presence or absence of oesophageal glands. As adults the female possesses but the male lacks a buccal stylet. By means of this stylet the female worm penetrates anywhere, without preference for any particular region, the body wall of the insect larva, reaches the body cavity and undergoes considerable external and internal changes becoming first torpedo-shaped and finally sausage-shaped. Although the *Scatopse* larva has four developmental stages the first and second are mainly parasitized to an extent of 25 per cent., the number of worms per host being usually one, seldom two and in very few cases three. The insect larvae suffer severely from the infestation as the fat-body is consumed and the host finally succumbs to the attack. The growth of the parasite is so rapid that female worms can reach maturity and produce a second generation before the host larva is half grown. Only female nematodes, already spermatized, leave the insect larvae since males possess no stylet and so cannot escape.

Only a small percentage of third and fourth stage insect larvae is infested with young female nematodes showing infection to be recent. The author considers that such larvae are destined to withstand the attacks of the parasite and reach the imaginal state which has a 5-10 per cent. infection. Usually 1-4 worms per adult host are found although as many as 20 have been recorded; they occur in the abdominal and not seldom in the thoracic cavities and, when few worms are present, the parasitism has no marked effect upon the flies. In imagines, nematode development may proceed, giving rise to abnormal and exceptional conditions, so that a female worm may contain within the uterus other females in all stages of growth some of which are gravid and producing larvae that escape. That is to say there may be three generations of parasites one within the other. Larval worms escape from the host during oviposition and are found in egg clusters where they remain to infect the *Scatopse* larvae as soon as they hatch.

In a discussion the author considers that the difference in morphology between the nematode under consideration and related insect parasites, viz., *Allantonema*, *Bradynema*, *Tylenchinema*, *Howardula* and *Parasitylenchus* are sufficiently marked to place it in a new genus. J.N.O.

272—Virginia Medical Monthly.

- a. WAMPLER, F. J. & SUTTON, jr., L. E.—“A study of the lung involvement in human ascariasis.” LIX (2), 65-72, 4 tables, 22 refs. [May, 1932.]

(a) Wampler and Sutton failed to ascertain the amount of lung involvement that occurred in naturally acquired cases of *Ascaris* infection by a study of 99 inhabitants of two villages in Wise County, Virginia.

There was an average eosinophilia of 10-19 per cent. which seemed definitely associated with ascariasis. Two cases with pneumonia showed no ascaris larvae in the sputum. Some of the bronchitis could have been attributed to ascaris migration but it could as readily be explained by the presence of an attack of the common cold prevalent at the time. R.T.L.

273—Zeitschrift für Fleisch- und Milchhygiene.

- a. MAY.—“Zur Behandlung finniger Rinder.” XLII (12), 239-240. [15th March, 1932.]
- b. NÖRR, J.—“Die Trichinose im Spiegel alter Karikaturen.” XLII (17), 348-351. [1st June, 1932.]
- c. THOMAS.—“Fütterungsversuche mit trichinösem Fuchsfleisch an Mäusen.” XLII (20), 398-399. [15th July, 1932.]
- d. NEUMÜLLER.—“*Echinococcus granulosus* (*Taenia echinococcus*) beim Fuchs, ein Beitrag zur Entstehung der Hülswurmkrankheit.” XLIII (1), 3-4. [1st October, 1932.]
- e. PRILLWITZ.—“Echinokokken in der Muskulatur eines Schweines.” XLIII (1), 4, 2 figs. [1st October, 1932.]

(a) Commenting on papers by Schmey and Bugge (1931), which advised that the chilling of cysticercus meat should be extended to at least 28 days and stated that four days of freezing are quite sufficient to kill both *Cysticercus bovis* and *C. cellulosae*, Dr. May points out the new difficulties with which meat inspectors and slaughterers are faced. The butchers already suffer considerable losses through the prolonged period of chilling. Freezing would similarly result in loss owing to the fact that the meat commands a lower price. In the “Schlachthofzeitung” (25.1.1932) he suggests that by the new Katadyn process it may be possible to secure better sterilisation of the air in cold storage. He also recommends that at any sale of meaty meat a notice “The meat must be well boiled” should be exhibited. This should suffice to protect the purchaser. R.T.L.

(b) Nörr illustrates the apathy, and even antipathy, of the general public towards the application of scientific knowledge by reproducing several humorous drawings and jokes on the subject of trichinous pork. All these appeared in the “Fliegenden Blätter” of 1864 and were directed against the newly introduced meat-inspection as an unwarrantable interference between man and pig, who had hitherto “striven together with exemplary love to make each other fat.” In the following year in Hedersleben there were 337 human cases of trichinosis, nearly one-third of which were fatal. B.G.P.

(c) Thomas describes the feeding of trichinous fox flesh to two mice, only one of which became infected though both were observed to eat flesh known to contain living cysts.

The infected mouse, which was killed 38 days after the first feeding and 7 days after a third feeding, contained very numerous larvae in various stages of migration and encapsulation. Although the original cysts in the fox were round or slightly oval, those in the mouse were elongate, contrary to Böhm's findings of round cysts in mice. The author suggests that the

shape of the cysts depends on the tone of the surrounding muscle fibres, and therefore on the general health of the host rather than on the host-species.

B.G.P.

(d) Neumüller records the examination of a fox which was heavily parasitized by many helminths including adult *Echinococcus granulosus*; evidently hydatid disease may be spread by these animals.

B.G.P.

(e) Prillwitz has found numerous sterile unilocular hydatids in the general musculature and diaphragm of a pig slaughtered in Greifswald.

B.G.P.

274—Zeitschrift für Infektionskrankheiten, Parasitäre Krankheiten und Hygiene der Haustiere.

- a. RAJEWSKAJA, S. A.—“Zur Charakteristik der Nematoden der Gattung *Nematodirus* Ransom 1907. (Versuch einer monographischen Bearbeitung).” XL (2/3), 112-136, 16 refs., 61 figs. [7th April, 1932.]
- b. FINKELDEY, W.—“Pathologisch-anatomische Befunde bei der Oesophagostomiasis der Javaneraffen.” XL (2/3), 146-164, 19 refs. [7th April, 1932.]
- c. CLARENBURG, A.—“Untersuchungen über die Lebensfähigkeit von *Cysticercus inermis*.” XL (2/3), 172-190, 22 refs. [7th April, 1932.]

(a) Rajewskaja has reviewed the genus *Nematodirus* in detail. After an historical note he gives a generic description. This is followed by (i) a fairly full description of each of the 18 existing species, (ii) a differential key to the species, (iii) a host-list which shows that with the exception of *N. weinbergi* in *Anthropopithecus* the hosts are all ungulates or rodents, and (iv) figures illustrating 15 of the species.

B.G.P.

(b) Finkeldey has investigated a severe oesophagostomiasis in Javanese monkeys (*Silenus fascicularis*) and here discusses the pathological findings and probable life-history of the parasite, apparently *Oesophagostomum brumpti*.

The adult worms, which appear harmless, eggs in the 8-cell stage or embryonated, and hatched rhabditiform larvae were all found free in the lumen of the large intestine. Nodules were plentiful in the wall of the caecum and, to some extent, of the ascending colon. Papillomatous lesions occurred in the gastric mucosa, haemosiderosis in liver and spleen, and small atelectatic areas and subpleural nodules in the lungs. The author thinks there may possibly be an intermediate host, e.g. fleas, or the infective larvae may be skin-penetrators. In either case they reach the large intestine *via* the blood stream and lungs after which the systemic route is more likely than the alveolar-tracheal route. Some appear to go astray into the gastric sub-mucosa and mucosa, where oesophagostome-like eggs have been found. After the emergence of the young adult from the nodule bleeding is copious, owing to haemolytic and anticoagulant toxins. The macro- and microscopic lesions are described in detail and illustrated with microphotographs.

B.G.P.

(c) Clarenburg gives details of the viability of *Cysticercus bovis* from an experimentally fed calf after chilling and freezing for varied times. [An account of these experiments, in Dutch, has already been abstracted in this periodical Vol. I, No. 3, Abstract 166a.] B.G.P.

275—Zeitschrift für Morphologie und Ökologie der Tiere.

- a. WUNDER, W.—“Untersuchungen über Pigmentierung und Encystierung von Cercarien.” XXV (2/3), 336-352, 15 figs., 21 refs. [28th June, 1932.]

(a) Wunder describes and figures the processes of pigmentation in *Cercaria monostomi* and encystation in *C. tuberculata* and *C. coronata*.

Within the redia, *C. monostomi* develops brown eye-spots which later turn black. From their neighbourhood four strands of pigment-cells proceed posteriorly and later cover the dorsal surface. More pigment-cells surround the cephalic ganglion.

In *Cercaria tuberculata* and *C. coronata*, bundles of bacillus-like rods appear in the parenchyme cells, at first between the pharynx and ventral sucker, later over the whole dorsal surface. The rods migrate into the cuticle and break up into granules which swell to form a cyst-like mass. When encystation is completed no rods remain (cf. the rhabdites of Turbellaria).

B.G.P.

276—Zeitschrift für Parasitenkunde.

- a. TALYSIN, T.—“*Dibothriocephalus strictus* n. sp. Menschenparasit des Baikalgestades.” IV (4), 722-729, 7 figs., 8 refs. [September, 1932.]
 b. GEBAUER, O.—“*Böhmiella perichitinea* n. sp., ein neuer Trichostrongylide (Nematodes) des Nutria.” IV (4), 730-736, 7 figs., 5 refs. [September, 1932.]
 c. NÖLLER, W. & SCHMID, F.—“Zur Diagnose des Lungenwurmbefalles bei Pelztieren.” IV (4), 737-747, 16 figs., 2 pages of refs. [September, 1932.]

(a) Talysin describes a new tapeworm, *Dibothriocephalus strictus*, parasitizing man on an island in Lake Baikal, where fish is the principal article of diet and is insufficiently cooked.

The worm, which has no definite “neck,” reaches a length of about 40 cm., with 180-360 segments having a maximum width of 4 mm. The segments are unusual in being long and narrow: even in the middle of the strobila the segments are twice as long as wide, and posteriorly the ratio increases to 4. A duplication of the genital apparatus commonly occurs, so that two sets occur in one segment in tandem arrangement. The mature uterus follows a zig-zag course and does not resemble a rosette. The eggs are small, 54 μ -57 μ by 40 μ . B.G.P.

(b) Gebauer has discovered a new trichostrongyle, *Böhmiella perichitinea*, n. g., n. sp., in the stomach of a coypu (*Myocaster coypus*).

The worm has some affinities with *Haemonchus* but has a well-developed buccal capsule containing one large dorsal and four small sub-ventral teeth. In the male there is a heavy brown cuticle surrounding the lateral and externo-dorsal rays on each side of the bursa and extending over the dorsal part of the body in the region of the stout, complex spicules. The dorsal

ray is asymmetrical in position. In the female the vulva is a transverse slit without a flap in the posterior third of the body, and there are well-marked ovejectors. Males 15-18 mm. long by 240μ wide at bursa; females 21-25 mm. long by $240-310\mu$ wide at vulva. Other helminths from the coypu are noted.

B.G.P.

(c) Nöller and Schmid indicate the main diagnostic features of the two lungworms in silver foxes: *Crenosoma decoratum* (Metastrongylidae) and *Capillaria aerophila* (Trichotrachelidae).

Unless the faecal sample is fresh, or was fixed when fresh, hookworm eggs will have hatched and it becomes necessary to differentiate the larvae of *Crenosoma* from those of hookworms and *Strongyloides*. Similarly the eggs of *Capillaria aerophila* must be differentiated from those of *Trichuris vulpis* (large intestine) and *Capillaria plica* (excretory bladder). The larvae of *Crenosoma decoratum* closely resemble those of *C. potos* described by Buckley (1930); they are relatively small ($265-330\mu$ by 16μ) with a short buccal cavity (6μ) which opens sub-dorsally. The eggs of *Capillaria aerophila* measure $62-73\mu$ long and $35-40\mu$ wide.

B.G.P.

277—Zeitschrift für Vergleichende Physiologie.

- a. ADAM, W.—“Über die Stoffwechselprozesse von *Ascaris suilla* Duj. 1. Teil. Die Aufnahme von Sauerstoff aus der Umgebung.” XVI (1/2), 229-251, 1 fig., 18 refs. [22nd February, 1932.]

(a) Adam has investigated the capacity of *Ascaris suilla* to absorb oxygen, in order to decide whether, in its metabolism, it is aerobic or anaerobic.

The worms were kept in Petri dishes in either Tyrode's or Kronecker's solution at 37°C . Adam determined, not (like former workers) the secretion of CO_2 in presence or absence of oxygen, but the actual absorption of oxygen as measured by Winkler's titration method or in Krogh's microrespirometer. He concludes that the worms can absorb oxygen, irrespective of a previous subjection to anaerobic conditions, the absorption being retarded by the presence of CO_2 . Even the body wall, pulverized with sand in a mortar, retained its absorptive capacity for at least two days.

B.G.P.

278—Zeitschrift für Veterinärkunde.

- a. GACKSTATTER.—“Einfluss von Wasser und Frost auf die Entwicklungsfähigkeit der Sklerostomeneier.” XLIV (9), 334-339, 7 refs. [September, 1932.]

(a) Gackstatter has investigated the effects of submersion under water and exposure to frost on sclerostome eggs in faeces.

Whereas after 12 days the eggs have developed and the hatched larvae have migrated from dry faeces, the segmentation process is completely arrested for at least 4 to 5 weeks if the faeces are submerged in water; the eggs are still viable, however. Exposure to frost for 10 days (average temperature $2-3^{\circ}\text{C}$.) merely retards segmentation.

B.G.P.

279—Zentralblatt für Bakteriologie. Abteilung I. Originale.

- a. FÜLLEBORN, F.—“Über die Taxen und das sonstige Verhalten der infektionsfähigen Larven von *Strongyloides* und *Ancylostoma*.” CXXVI (3/4), 161-180, 12 figs. [17th November, 1932.]
- b. PODJAPOLSKAJA, W. P. & GNEDINA, M. P.—“*Diphyllbothrium tungussicum* n. sp., ein neuer Parasit des Menschen.” CXXVI (5/6), 415-419, 6 figs. [15th December, 1932.]

(a) Fülleborn has investigated the reactions of infective hookworm and strongyloides larvae to various physical stimuli, and in this second paper joins issue with Clayton Lane on several points.

While hydrotaxis has not been proved, the author finds that humidity influences the aggregation of larvae into tufts. Strict thigmotaxis, whereby the larva adjusts its head at right angles to a surface, has not been demonstrated. The larvae press against the walls of fine capillaries where, however, they can still turn round. When the head touches an obstacle, or the body is mechanically held, the larva's movements increase; this also happens in serum, owing to agglutination tending to impede movement and not, as Lane holds, owing to a chemical stimulus penetrating the sheath. Oxygen is a positive, and carbon dioxide a negative stimulus.

In the matter of rheotaxis, where larvae face the water-current and oppose it, Lane's objection that this is a mechanical effect depending on the heavier anterior end is valid. Fülleborn claims that the larvae are definitely attracted by heat and not merely stimulated to greater activity. No phototaxis is observable. [This extensive paper is illustrated, partly with microcinematograph records.]

B.G.P.

(b) Podjapolskaja and Gnedina describe a new species of *Diphyllbothrium*, *D. tungussicum*, from the Tungus of Eastern Siberia.

It differs from the other species recorded from man in the bean-like shape of the ovary, with the concavity directed anteriorly, and the uterus which has 4 loops on each side. The strobila is about 600 mm. long and 3.56 mm. at its widest; mature segments measure 1.26-1.71 mm. long. The ova, which measure 72-75 μ by 48-51 μ , have a wall with an alveolar structure. Multiple infections with *D. latum* also occurred.

B.G.P.